December 4, 1950

STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS — PAGE 55

THINSTEEL KNOCKS OUT MR. O.V.

Since the cost of the flat-rolled steel you use in your product is actually determined by units of production per ton, rather than "price per pound," OVERSIZE VARIATION in strip thickness can take you for a loss in the first round.

Thinsteel, precision cold-rolled strip in low carbon, high carbon (annealed or tempered) and stainless grades, surely and quickly "K. O.'s" O V.—does it with extreme accuracy to gauge that insures maximum yield per ton.

Now, we're trying to win the fight for increased Thinsteel production to match demand. New mills and other expanded facilities already are helping and there is more to come.

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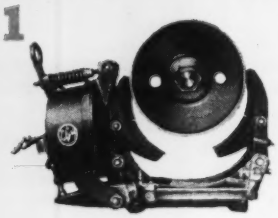
LET EC&M SUPPLY FULL COVERAGE

BRAKES · DISCONNECT SWITCHES
CONTROLLERS · LIMIT STOPS

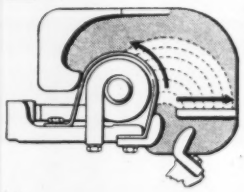
EC&M's Complete Line Includes—

1



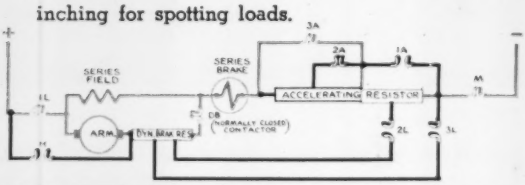
LONG-LIFE brakes for cranes operated by a-c or d-c power. . . Give high speed performance—with low upkeep.

2



Contactors operate on the LINE-ARC principle — no destructive burning of arc shields—cool contacts . . . reduced maintenance.

3 Simplified, Safe Dynamic Lowering Circuits for hoist motions respond quickly and permit accurate inching for spotting loads.



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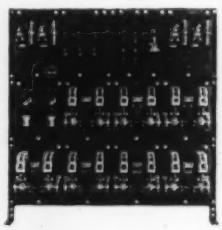


Reversing-plugging Control for bridge and trolley motions — automatically-controlled acceleration and only one adjustable relay for plugging.

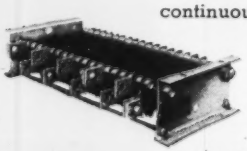
5

Youngstown Safety Limit Stops protect against overhoisting accidents—a positive check against human errors.

6

Cam-type Master Switches have narrow width and short throw—less fatiguing on the operator.

7 Tab-Weld Plate Resistors—spot-welding provides a continuous path, and keeps resistance value constant.



8

Manual-magnetic Disconnect Switches operate with ease—are arranged to control crane lights, too.

Put your crane control problems up to EC&M. Each job is accurately engineered to give fine performance. When buying cranes, specify EC&M for complete crane control.

THE ELECTRIC CONTROLLER & MANUFACTURING CO.

2698 E. 79th St. Cleveland 4, Ohio

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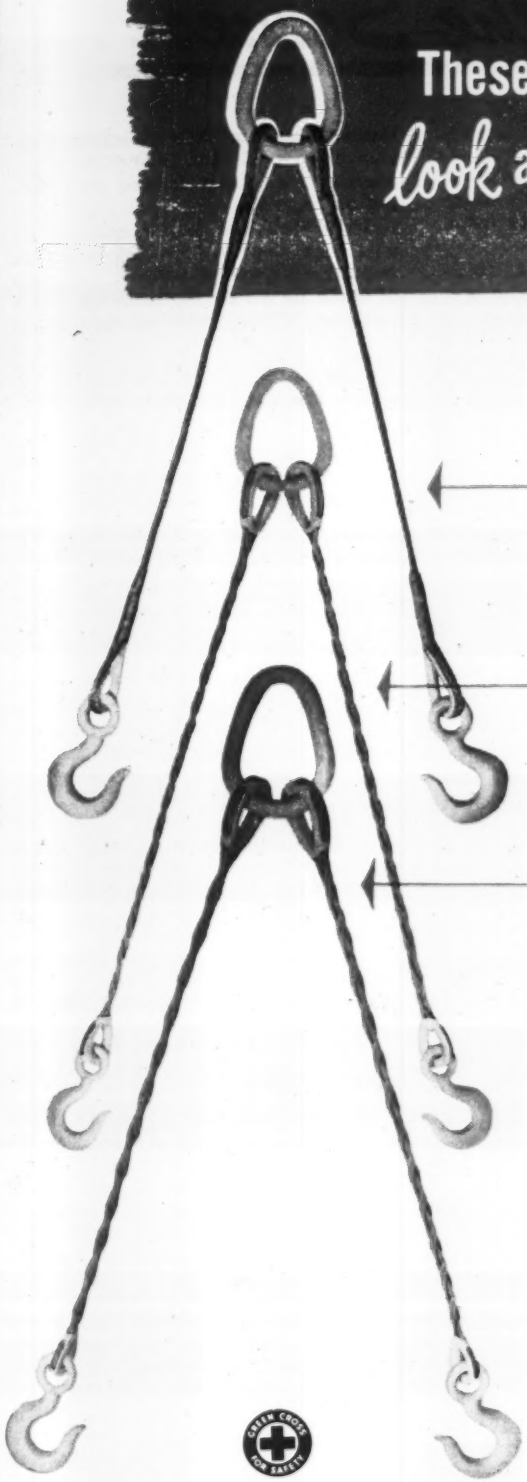

Assembly E-2 Single-part body

THE MONARCH SLING

Made from a single-part of Monarch Whyte Strand Wire Rope. Many sizes and types.

Assembly E-2 6-part flat-braided body

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Braided from one endless wire rope — very flexible and kink-resistant. Many sizes and assemblies.

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995-S

For cranes and hoists use PREformed
MONARCH WHYTE STRAND CRANE ROPE *made by*
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are Frequently Solved

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SEMISILICA BRICKS

When heating furnace roofs, open hearth regenerator roofs and hot blast stoves are operating in the temperature range of 2200F.-2700F. for sufficient time to cause "First Quality Clay Bricks" to spall and vitrify or sag—and where the performance of silica bricks is hindered by shutdowns and severe temperature changes, a need is created for REMMEY RM Semisilica bricks.

If your furnace problem falls in this category, Semisilica bricks are the answer . . . specify REMMEY RM Brand SEMISILICAS.

REMMEY

Dependable Refractories

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Behind the Scenes . . .

What's Cooking

We went on a scouting expedition a while back to find out what's cooking for the yearbook issue, to come out Jan. 1, 1951.

We found Editor Irwin Such, Managing Editor Walt Campbell and Associate Editor John Morgan mapping out an article on economic prospects in metalworking for the next ten years. We found Associate Editor Vance Bell getting lined up to expand and refine the Facts and Figures section. The editors believe that part of the annual issue, featured every year, gives you the most complete statistical picture of the past and present metalworking performance to be obtained anywhere in one place. We also found the engineering editors hard at work shaping up their forum on technical progress in metalworking.

But what really has the boys steamed up are front covers. Beginning Jan. 1, STEEL will use editorial material. Assistant Editor Ed Birkner, Art Department chiefs Don Cadot, Bill Kellogg and "Mac" Mac Bain —everybody, in fact—are getting the new covers off to a good start with a bang-up job for the annual.

Miscellany

You will be relieved to learn there's to be a "Large Size Week" celebrated in 1951.

It is just one of 68 promotional days, weeks and months listed in Commerce Department release OIC-100. Run right over to your nearest Commerce field office to get a copy.

We also note in a catalog of the Yale Co-operative Association, a store for Yale students, that a Yale parasol is available. It's made of blue cotton and white rayon. The end of the handle is equipped with a whistle. Oh, those Elis!

Expansion

The editors last week on page 27 estimated new capital plant and equipment expenditures for 1951 would be $21.6 billion, up 20 per cent from 1950. Every week STEEL's editorial and advertising pages deal with aspects of the problem of re-equipment and capital expansion.

Among the new apparatus described today are Brown & Sharpe Mfg. Co.'s new milling machine on pages 40-41, Landis Machine Co.'s attachment device on page 2 and May-Fran Engineering Inc.'s new hinged steel belting on page 59.

The editors are dealing exhaustively with the depreciation phase of the capital equipment subject. Reprints of their forum on depreciation, which ran Nov. 27, are available from Reader's Service, Penton Bldg., Cleveland 13, O.

Castaway

Not too long ago, in Roxbury, Mass., a small child made the pages of *Life* and a good many newspapers by finding herself locked in a super market whereupon she proceeded to gorge herself with ice cream, fruit and beverages.

We're relieved to report that such things aren't as likely to happen if a store gets equipped with a new lock put out by Detroit Steel Products Co. "It can be operated from the inside at all times by a child or a customer," Detroit Steel tells us.

Big Year

Fifty-two weeks in a year? Not as far as STEEL is concerned in 1951. Next year there'll be 53 Mondays and 53 issues to come across your desk.

Next year will be the tenth time since this magazine started 69 years ago in 1882 that it has published 53 issues instead of 52.

Puzzle Corner

Charley travelled 330 miles in the Nov. 20 problem. First in with the correct answers were James S. Miller of Armco Steel Corp., L. A. Bish of Republic Steel Corp., T. S. Bean of Barber & Ross Co. and Steve Schemine of Hobson Cutter Division, Valves & Presses.

This puzzle comes from Thomas Cannarella of Wheeling Steel Corp.: Driving on Route 20, Scott left Elyria, O., at 7:40 a.m. for Erie, Pa. Driving in the opposite direction, Pyle left Erie, Pa., at 8:30 a.m. for Elyria. At 9:10 a.m. they passed each other near Ashtabula, O. They arrive at their respective destinations simultaneously. At what time did they arrive?

Shrdlu

(Editorial Index—page 55)

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

or Missionary

Are you getting full value from your salesmen? Or are you letting them waste their valuable time on parts of the selling job that could be done more easily and economically by advertising?

Your salesmen's main value to you lies in their ability to present your product to each prospect in terms of its specific usefulness to him; then to close the order. Time spent on missionary work costs money . . . your money. It is definitely to your advantage to help them concentrate their time on the job that they alone can do . . . and do best.

Well planned advertising can conserve the time of your salesman in a multitude of ways. It can bring your product to the attention of all the men who directly or indirectly control its purchase. It can arouse interest and create preference in advance of your salesmen's calls. It can keep contact with buyers between your salesmen's calls.

The list at the left shows some of the jobs that well planned advertising can do. Take time to check it over. It may give you a better idea of how so many successful industrial firms use advertising to step up the effectiveness of their sales operations.

* * *

• *This message—one of a series by members of the National Industrial Advertisers Association—is published by* STEEL *to create a wider understanding of industrial advertising and the contribution it is making to American industry. Reprints of this message are available in limited quantities. Address:* STEEL, *Readers Service Dept., Penton Building, Cleveland 13, Ohio.*

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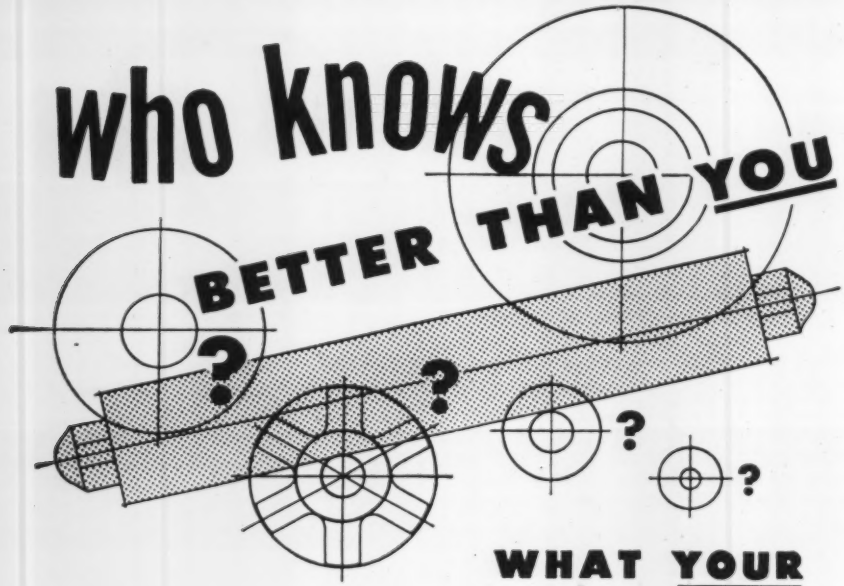
A CHAPTER OF THE NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

A national organization, comprised of 3,500 members of the 34 local associations of industrial advertising and sales executives—dedicated to greater efficiency in industrial distribution—and lower sales cost.

who knows BETTER THAN YOU



WHAT YOUR ROLL REQUIREMENTS ARE?

When your roll requirements can be satisfied by rolls built to liberal tolerances you don't want the expense of dimensions held to a "tenth" . . . and when you must have rolls with critical tolerances around that "tenth" you can't afford *not* to get that precision . . . *the first time!*

That's where Gorham rolls fit into your picture. We're completely equipped and qualified to fill your requirements in cold mill rolls, including working rolls, intermediate rolls, drive rolls and specials. *Your* specifications run the show. When you want ordinary commercial tolerances, that's what you get . . . and when you require extremely close tolerances, our experience, equipment and skilled personnel assure you precision, right on the "tenth".

Gorham rolls are manufactured from the steel best suited to your job, properly heat treated for correct hardness and wear resistance and ground to the dimensions and finish *you* specify. We furnish a wide variety—from small rolls for the smallest Sendzimir precision strip mill up to rolls 14 inch diameter, 6 feet long. Gorham field service engineers, who can give you valuable assistance, are conveniently located in principal industrial centers.

We invite you to join the list of operators *and* manufacturers of rolling mills whom we now serve. You'll find us a convenient and cooperative source for your roll requirements. Send us details of your rolling problems for recommendations, or your roll specifications for a prompt quotation.

Gorham TOOL COMPANY

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

LETTERS
TO THE EDITORS

European Steel Sources

I have read in your magazine that steel can be obtained from the various countries in Europe. This is very interesting to me, but I do not know whom I might write about placing an order. Could you tell me where this information could be obtained.

H. G. Mullett, Vice President
Bradley Washfountain Co., Milwaukee, Wis.

• *We do not have a complete list of importers. It is believed that you can obtain more information from the National Council of American Importers, 45 E. 17th St., New York 3, N. Y.*

Here's How

Will you please give me some information on the National Production Authority? I am interested in knowing how to extend any ratings we may receive to our suppliers.

W. B. Hartley, General Purchasing Agent
Perfect Circle Corp., Hagerstown, Ind.

• *When applying or extending a rating, place the prefix DO (defense order) and two digits supplied, on the purchase order or separate paper attached. Mark it "certified under NPA Regulation 2". This tells supplier and NPA that the purchaser is authorized to use rating for delivery of materials covered by order. Purchase or delivery orders must be signed by person authorized to sign. Signatures may be written or rubber stamped. You can obtain a copy of regulation 2 from National Production Authority, United States Department of Commerce, Washington 25, D. C.*

Is Plate Problem Answer Near?

I have read with interest the article entitled, "Answer to Plate Problem Near", in the Oct. 30th issue of STEEL. I do not quite agree with the contents of this article; also, I am of the opinion that plate production in 1951 will be sufficient to take care of all freight car production without shifting rolling mills from sheet production.

The 1949 figures of plate production of the American Iron and Steel Institute give a good breakdown as to various users of plates; I have come to the conclusion that freight car production based on 10,000 cars a month will have sufficient plates for 10 months during 1951 and that there will be sufficient plates for other users.

O. S. Stroh
Standard International Corp., New York, N. Y.

• *Plate shortage is bothering a lot of people, including officials of the National Production Authority and many civilian consumers. We know of several steel mills that are planning to convert some of their sheet rolling facilities to plate production by Jan. 1. With more plate being allocated to Great Lakes vessel construction, and probably a still larger tonnage to the petroleum industry and other defense-support programs such as mining, power generation and inland water barges, the plate supply outlook for 1951 is reason for concern.*

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 127 NO. 23 DECEMBER 4, 1950

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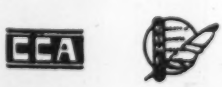


NEWS

★ Letters to the Editors 8
★ As the Editor Views the News 57
★ News Summary 61
Double Trouble: Weather and Korea 63
NPA's Iron & Steel Division Will Ignore Fringe Complaints 63
You Can Get a DO Rating for Capital Equipment 64
Jones & Laughlin Gets Approval for Fast Amortization 65
Steel Expansion: Fast, Far—with Optimism 65
Carborundum, Minnesota Mining Discuss Merger 66
Steel Wages and Prices Go Up 67
Standardization Is Important Industrial Tool 68
NSRB Studies Conservation 69
★ Windows of Washington 70
Korean War Is Economic Spur to Sweden and Italy 74
★ Mirrors of Motordom 77
★ The Business Trend 80
★ Men of Industry 84
★ Obituaries 89

PRODUCTION-ENGINEERING

★ Production and Engineering News at a Glance 91
New Electrolytic Process Produces High Purity Chromium 92
British Firm Cuts Stainless Manufacturing Costs 94
120 Transmission Pawls Broached Every Hour 95
Close-Tolerance Die Castings Cut Auto Transmission Cost 96
★ Seen and Heard in the Machinery Field 98
Wheel Re-turning Time Halved 99
Extruded Bronze Speeds Jet Bomber Production 100
Profits from Cubic Inches 101
More Kitchen Cabinets in Less Time 104
★ Progress in Steelmaking—Faster Cooling Key to Jacquet Continuous Casting Method 108
★ New Books 132
★ Calendar of Meetings 137
★ New Products and Equipment 139
★ Helpful Literature 145

MARKETS

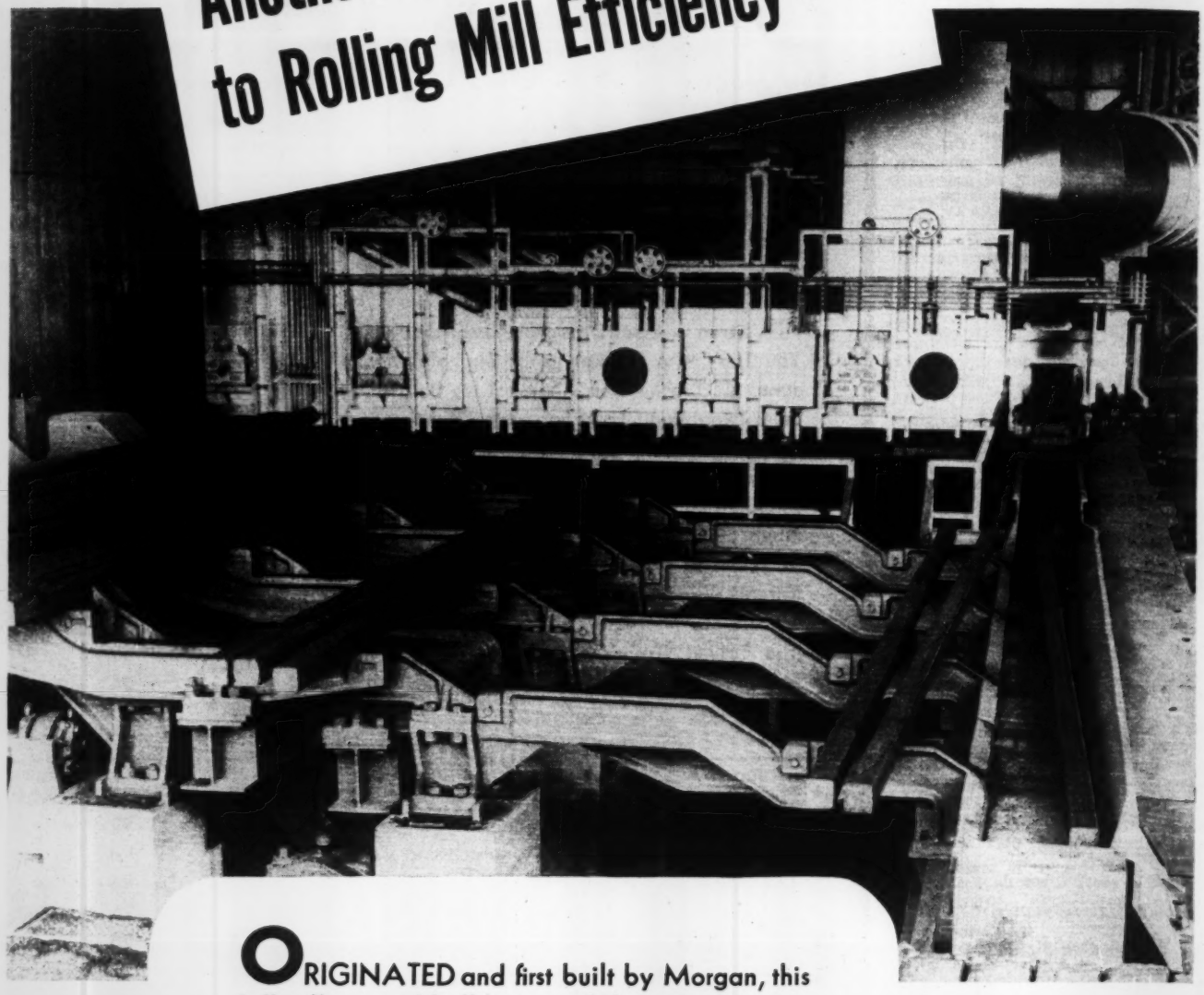
★ Market Summary 147
★ Metal Prices and Composites 148
NPA Limits Civilian Use of Copper 154
★ Metalworking Briefs 169

★ *Denotes regular features*

Advertising Index—Page 178. Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

Next Week ... **Abrasive Belt Polishing—An Economical Finishing Tool ... Automatic Sorting Speeds Piston and Wrist Pin Production ... Integrated Processing Boosts Conduit Output ... French Building Two Continuous Hot Strip Mills**

Another Morgan Contribution to Rolling Mill Efficiency . . .



ORIGINATED and first built by Morgan, this billet "unscrambler" is one of the interesting innovations in the Colorado Fuel and Iron Corporation's new Morgan 3-strand rod mill at Pueblo, Colorado.

These billet and slab separating skids—with the furnace charging conveyor, the ram type charger and furnace cross pusher—are operated in complete safety by one man. For the current high tonnage demands, these mechanical skids can handle billets and slabs at rates up to 200 tons per hour.

If you have a rolling mill problem that needs "unscrambling" why not discuss it with our engineers?

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

RM-33

MORGAN
WORCESTER

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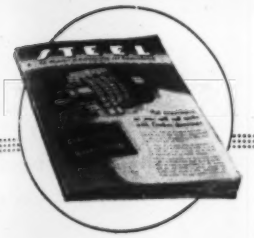

December 4, 1950

Industry Is Ready

Ever since the United States entered the war in Korea on June 27, heads of American industrial enterprises have been waiting impatiently for definite orders from Washington as to what the military wants and needs for its preparedness program. A relatively small number of defense contracts has been let, but in the main the list of essentials required by our military commitments still is discouragingly vague.

In spite of its failure to obtain blueprints and contracts from Washington, industry by and large has done a good job of preparing for the job ahead. Without waiting for detailed specifications, management is expanding plant capacity, purchasing modern machine tools and equipment and reviving all of the tricks learned in World War II to provide for the procurement of materials and supplies and for the hiring and training of adequate personnel. It is safe to say that in many respects the executives of private industrial companies have been more forehanded and more realistic in their anticipation of the big job ahead than have been the officials of some key departments of the government in Washington.

For months, managers of industry have been virtually shouting "We're ready. Tell us what you want done!" The response from Washington has been a dozen or more regulations or complicated directives for each "go-ahead" signal on a specific work contract. Naturally the public has gained the idea that the administration is tacitly condoning a preparedness program timed to slow motion.

Last week's developments in Korea and at Lake Success may shake Washington officialdom out of its lethargy and indecision. Even assuming that the present bold and insolent attitude of the Chinese reds is a Soviet trick to stage a serious threat in Korea with which to wield a blackjack upon the United Nations at Lake Success, the situation is grave. The chief threat is that so much dynamite is in the hands of irresponsible but currently powerful Soviet dictators. Another disconcerting factor is that our allies cannot or will not be of much help to us.

This is a time for steadiness and courage. Next to the spirit of the people, our industrial potential is our greatest asset. Industry is alert, confident and prepared for whatever lies ahead.

* * *

STORM LOSS IS HEAVY: Every now and then Dame Nature puts on a demonstration which makes man's efforts to combat it seem absurdly puny. This was the case last week when an exceptionally heavy fall of snow almost completely paralyzed a widespread area in the heart of the nation's metalworking industry south of the Great Lakes and a windstorm with gales of more than 90 miles per hour played havoc with industrial sections of the Atlantic Seaboard.

The storm blanketed the Pittsburgh, Youngstown, Cleveland and nearby areas with 20 or more inches of snow, which drifted to four feet or more in many spots. Urban and interurban highway traffic was halted. Railroads kept trains moving but on erratic schedules. Airplanes were grounded by impassable runways. Officials declared several cities and one state to be in a state of emergency. Hundreds of thousands of employees were stranded at home or at work for 48 hours or more.

Impact of the storm upon industry was terrific. Steel ingot production in the Pittsburgh

(OVER)

district was down 50 per cent for the week. Substantial losses in steel output also were suffered in the Cleveland, Youngstown, Canton, Detroit and Chicago areas. It is estimated conservatively that the direct production loss in the metalworking industry chargeable to the storm amounts to $192 million. Steel ingot production losses ran to 450,000 tons.

It is fortunate storms of such severity do not occur frequently. Our modern way of life is not prepared for them. —p. 63

* * *

AID WITHIN REASON: National Production Authority is well aware of the problems of consumers and has announced its desire to help them in procuring needed materials under certain conditions. However, experience has shown that among those who ask assistance are many who have not exhausted their own resources in solving their procurement problems. Also, some who request aid are asking for favors that cannot be justified under present circumstances.

For these and other reasons, NPA has announced that it must ignore five types of pleas for assistance. These are: 1. Consumers who have not tried hard to solve their procurement problems. 2. Civilian consumers who claim that they are receiving less than their equitable share. 3. Consumers who ask for preferment on the ground that they are paying more than the normal price because of distance from supplier. 4. Consumers who, possessing stocks for current needs, ask NPA for assurance of supplies for future needs. 5. Consumers who do not represent a desirable credit risk. —p. 63

* * *

AUTO DEMAND IN 1951: Most automobile builders remain confident of good business in 1951. They assume that output will be cut substantially from the high of 1950 and that a certain curtailment in buying will result from the government's restriction on credit. Nevertheless they are optimistic. As recently as last week, a spokesman for Chevrolet expressed the belief that next year will be a good automobile year. Chevrolet dealers have 200,000 unfilled orders and no dealer is overstocked.

This prophecy probably was voiced before the implications of events in Korea and the storms at home were realized fully. The more critical become events in Korea, the more drastic will be the cutback in automobile production. The more severe the weather at home, the greater will be the demand for automobiles. At this moment, it seems safe to say that there will be a ready market for all the cars that can be built in 1951. —p. 77

* * *

CUTS TIME IN HALF: Shortly after carbide cutting tools came into use, it became apparent to machine tool builders that if the advantages of the new cutting material were to be utilized fully, the machines on which they were used would have to be made stronger and more rigid and provided with more power. These changes have been taking place on new machines designed for carbide tooling, but there are many instances where old machines have been adapted to carbide tools.

A good illustration of such adaptation is found in the Los Angeles shops of the Southern Pacific. A 52-inch carwheel turning lathe which with orthodox tools had been driven at 2 rpm was reinforced, repowered and speeded up to 24 rpm to accommodate carbide tools. By virtue of these changes, the time required for re-turning the treads of car, tender, locomotive pony and trailer and certain diesel locomotive wheels was cut in half. —p. 99

* * *

CAST INGOTS ON SIDE: During the past few years an unusually large volume of experimental work on the continuous casting of steel ingots has been announced. Additional projects come to light occasionally and doubtless other developments are underway which thus far have not been publicized. If all the facts were known, perhaps there is more activity along this line today than at any previous time.

One of the most recent proposals to be announced comes from Belgium. J. F. Jacquet, technical secretary of the Belgian Blast Furnace & Steelworks Association, is working on a method of continuously casting ingots horizontally. Ingots are cast six at a time, with three molds on each side of a centrally located ladle. The author of the idea claims that pouring the ingots in a horizontal position makes for faster cooling of the metal because of the larger area of contact between the ingot and the wall of the mold. —p. 108

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

UP WAGES, UP PRICES— Better start refiguring your costs on the basis of higher steel prices and possibly higher wages in your own plant. While the steel price increase (p. 67), averaging $5.50 a ton, is modest considering the 16-cent hourly wage increase granted steelworkers, it may cost the metalworking industry $412 million a year. New demands for wage increases may be made on metalworking companies. United Steelworkers will ask for 16-cent hourly increases from metalworking companies with which it has contracts, but may negotiate settlements at a lower figure where conditions necessitate.

MORE HEADACHES— Brace yourself for more supply troubles and heavier demands for your products because of twin disasters—bad weather in the U. S. and reverses in Korea—that hit the nation last week (p. 63). The storms tied up about 37 per cent of America's steel capacity for two and a half days in the week ended Dec. 2 and dropped the national ingot average 21 points, to 81.5 per cent of capacity. Steel production loss was 450,000 tons of ingots. Lost metalworking production hit an estimated $192 million. The Korean situation undoubtedly will increase demand for defense products metalworking turns out.

KOREA AND EUROPE— The Korean war has been an economic spur to both Sweden and Italy (pp. 74-75). It will continue to boost output in 1951. Sweden's stability continues despite labor shortages and difficulties in shifting to an industrial economy. The country, closely tied to Germany before the war, is trying to diversify its foreign trade. Italy has shown spectacular economic gains in the past year. ECA will continue in 1951 to help the country boost its expenditures for new plants and equipment.

LESS COPPER— NPA's order cutting copper consumption next quarter (p. 154) is making automakers radiator conscious. Steel radiators require more frontal area, raise corrosion problems.

FOREIGN STEEL— Metalworking companies are looking for steel from abroad, sometimes with success, more often without. Even the new Chilean mill is deluged with inquiries; an open spot on its plate schedule for 2200 tons was quickly taken last week at about $150 a ton. German mills are getting more orders than they can handle. Commercial hot-rolled sheets were reported momentarily available at prices from $177 to $199 a ton.

FAST AMORTIZATION— Look for quicker action on application for fast amortization of defense plants in coming weeks. J & L Steel (p. 65) is first to get the nod on a $144 million expansion program.

HELP ON EQUIPMENT— You may be able to extend a DO rating for machine tools or production equipment (p. 64). But don't expect too much.

MORE GUNS, SOME BUTTER— Standardization is an industrial tool that can help achieve more of both, says the American Standards Association (p. 68).

HERE AND THERE IN INDUSTRY— Minnesota Mining & Mfg. Co. and Carborundum Co. are considering merging, based on an understanding that there will be continued autonomy of operations . . . R-S Products Co., Philadelphia industrial furnace manufacturer, was purchased by S. Morgan Smith Co., York, Pa. . . . American Shipbuilding Co. got the contract to build the tenth ore carrier to be ordered for the Great Lakes in the last few months. The boat is to be 12 feet longer than the *Wilfred Sykes* (p. 66).

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Double Trouble: Weather and Korea

Storms in the U. S. and reverses in Korea will make steel supply problems worse than ever. Full-scale industrial mobilization is a certainty now

THE NATION was hit by twin disasters last week—storms in the U. S. and reverses in Korea—that are having sharp effects on metalworking.

The blizzard which started late Nov. 24 dropped the national steel ingot rate 21 points to 81.5 per cent of capacity in the week ended Dec. 2. The decline is accounted for by weather troubles in nearly every part of the U. S. except the South and Far West, but the cutbacks were particularly severe in Pittsburgh, Youngstown and Cleveland areas which carried the brunt of the snow storm and which normally produce about 37 per cent of all the steel made in the U. S. each week.

Far Down—Pittsburgh operations dropped to 48 per cent as some 300,000 tons of ingots were lost. Youngstown operations slumped to a low of 40 per cent as production slipped by some 125,000 tons in the week ended Dec. 2. The Cleveland rate slumped to 78.5 per cent of capacity as nearly 21,000 tons of ingots were lost. Recovery in Pittsburgh, Youngstown and Cleveland was slowed as the weather again worsened Nov. 29. No serious damage to steel facilities is reported in the areas.

The national ingot production loss is estimated at 450,000 tons.

The steel shortage will be worse than ever now, but the full effects on steel supplies won't be felt for another week or so. Metalworking plants in the Midwest and the East last week were more concerned with getting dug out of snow or repairing wind and water damage than with buying steel.

Lost: $192 Million — The storms cost metalworking $192 million in lost production, STEEL estimates. That is equivalent to about 12 per cent of the average weekly business the industry is doing.

Brunt of the snowstorm and its paralyzing effects were borne by Ohio, Pennsylvania and Michigan. Those three states have approximately 25 per cent of the nation's metalproducing and metalworking plants. Work time lost in those three states and in New York state and other metalworking areas where strong winds and heavy rains impeded industrial production was equivalent to 2.5 days in the tri-state area of Ohio, Pennsylvania and Michigan.

Impossible to estimate are the losses that will result in weeks or months to come by production stymied for want of a critical part that didn't get produced early last week because of the storm.

Broad Shoulders — Reverses in Korea undoubtedly will boost demand for the defense products turned out by metalworking. If there was ever any doubt about the seriousness and extent of industrial mobilization, all are dispelled now.

Not only will the Chinese push in Korea put added demand on industry's shoulders, but it will hit it soon in other ways, too. Manpower will become increasingly tight. Government controls on wages and prices are more likely. Sen. Robert A. Taft says he "would not be surprised" if more controls come when the defense budget exceeds $40 billion.

Leon Keyserling, chairman of the President's Council of Economic Advisers, foresees a possible defense economy that would require a federal budget of $75 billion.

NPA Turns Its Back

Its Iron & Steel Division, swamped by pleas for help, will ignore fringe complaints

NATIONAL Production Authority's Iron & Steel Division is being swamped with pleas for help in getting steel and is forced to ignore five kinds of calls for aid.

1. It will give no assistance to a steel consumer, whether he has a DO-rated order or is a manufacturer of non-rated civilian products, who has made no thorough attempt to procure steel.

2. Makers of civilian goods who have made a conscientious canvass of steel sources won't get help unless they can prove they are currently getting less than their equitable

NEA

OVER THERE—It was rough going for American tanks that made it over the mountains to the Chosin reservoir in North Korea. The tanks took the trip over the snow to bolster UN foot troops and had to beat a retreat in the face of the strong Red drive

NEA

RIGHT HERE—Midwestern cities like Pittsburgh, Cleveland and Youngstown also found the going rough when the worst storm in several decades paralyzed traffic and dampened industrial production. National Guard tanks were called out to get things moving again

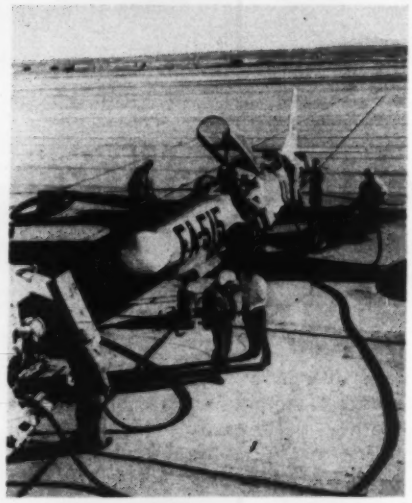
share of tonnage available for civilian distribution.

3. NPA won't lift a finger on consumers' complaints that they have to pay higher delivered costs because they must go farther to get their steel.

4. NPA will not give assurances to consumers as to their future steel supplies. Many consumers come to NPA for help solely because they are concerned with their future supply of steel. Not knowing definitely how much steel will be required for DO-rated orders or for allocated programs in the future or how much production might be lost by adverse weather or labor conditions, NPA will not forecast how much steel will be available to civilian users months ahead.

5. NPA will not press a supplier to help out in a hardship case where the consumer, for credit or other reasons, is an undesirable customer.

On the other hand, it is a firm NPA policy to consider problems of small business. Small business problems, of any nature, may continue to be brought to the attention of NPA's Small Business Division, either in Washington or at the Commerce Department's field offices all over the country.



NEA

THE PRESSURE IS ON: Lockheed Aircraft Corp.'s F-94 underwent accelerated service tests at Muroc, Calif., so the Air Force could gain maintenance and supply information quickly. Six months' war-type flying was crammed into 30 days by 24 pilots and 100 ground crewmen of the Air Materiel Command. Now in full production at Lockheed, the F-94 succeeds the F-80 Shooting Star, which was first U.S. jet fighter to meet Russian-built jets in combat over Korea

You Can Get a DO for Capital Equipment

NPA will issue the priorities sparingly, but they will be granted if a company can prove it needs production machinery to get out a rated order

YOU CAN GET capital equipment with a DO rating if it's necessary for your defense production, but the priorities are being granted very sparingly.

There has been widespread misunderstanding on that point, particularly by people trying to get machine tools, because of this language in Section 11.6 of National Production Authority's Regulation 2: "A person who has received a rated order may not extend the rating to get material for plant improvement, expansion or construction, or to get machine tools or other items which he will carry as capital equipment, or to get maintenance, repair or operating supplies."

By the Back Door—But Regulation 2 authorizes use of DO ratings to get "materials," and Section 11.2 (b) defines "materials" as "any raw, in process, or manufactured commodity, equipment, component, accessory, part, assembly or product of any kind." And Section 11.5 provides that a DO rating may be used to rate orders for "production materials and components, including packaging and chemicals," necessary to execute the rated order.

Clearing away that legal double-talk, NPA interprets its meaning this way: A DO rating may not be used to get capital equipment, except when the priority is needed to get machinery to execute a rated order. NPA has empowered the Army, Navy, Air Force, Atomic Energy Commission, National Advisory Committee for Aeronautics and the Coast Guard to use DO ratings to get production equipment.

Prepare Your Case — To obtain such assistance, you need the equipment to fulfill your contract; show you have been unable to subcontract outside concerns possessing such equipment; show you cannot get the equipment by a reasonable delivery date without priority assistance. Then, get written authorization from the contracting officer with the principal interest in your contract or subcontract to use a DO rating.

Agencies authorized to use the DO ratings for tools, dies, jigs, fixtures, abrasives, machine tools and other production equipment have been given a limit in terms of the dollar value of the equipment that may be obtained under those ratings. The policy stems from two reasons: Contractors are expected to spread defense work to a maximum number of small business concerns by subcontracting; the manufacturers of machine tools and other production equipment, whose delivery dates in many cases are moving farther into the future, should not be burdened unnecessarily with orders for equipment when existing facilities can be found to do the work.

By the Numbers—Various DO ratings are available for use in obtaining production equipment. Where title to the equipment is to be vested in a military contractor or subcontractor, the rating is DO-98. Where title is to be vested in the Army, Navy or Air Force, the rating is DO-21. When the contractor or subcontractor is building vessels for the Army or Navy, and production equipment is to be installed as part of the ships' facilities under an allowance arrangement, the rating is DO-03.

When the contractor or subcontractor is building mobile repair shops for the Army, Navy or Air Force and needs assistance in procuring new production equipment to be incorporated as part of the mobile equipment (meaning the machine tools and production equipment constituting these mobile shops) the rating is DO-04. Similar ratings used by the Atomic Energy Commission are DO-40, 41, 43, and 44, by the National Advisory Committee for Aeronautics D-50 and 51, and by Coast Guard DO-60 and 62.

Instrument Maker Protests

If the cut ordered for allocation of aluminum continues to apply to industrial instrument production, it may seriously affect the defense program, charges Henry F. Dever, president of Brown Instruments Division, Minneapolis-Honeywell Regulator Co.

"If electronic and other types of industrial processing instruments are given a priority status not yet granted," says Mr. Dever, "the cut should not seriously affect either instrument production or production of defense materials for which the instruments are vital." He says that the industry cannot use many substitute materials and that the amount of all basic metals needed by the

entire industry is relatively insignificant.

If no relief comes, says Mr. Dever, the limiting order on aluminum to 65 per cent of consumption will cut industrial instrument output to about 50 per cent of the present demand. The industry may get around the problem if it's permitted more liberal use of DO ratings.

J & L Gets Expansion Nod

Fast amortization authorized for $144 million defense steel plant program

JONES & LAUGHLIN STEEL CORP. becomes the first company to get government authority to write off its defense expansion in five years. The company was granted necessity certificates for a $144 million expansion by the National Security Resources Board last week.

The expansion, details of which are expected next week, will result in an increase in steel ingot capacity of 1,200,000 tons. Coke and related by-products will be increased 266,400 tons and electrolytic tin plate by 168,000 tons.

Stuart Symington, NSRB chairman, says many companies, including steel producers, have made application to take advantage of the fast amortization section of the 1950 revenue act. They will receive decisions within a short time.

Chester Furnace To Operate Soon

The Chester, Pa., furnace, a subsidiary of the Central Iron & Steel Co., Harrisburg, Pa., is expected to get into operation by not later than February. The furnace, 500 tons daily capacity, was acquired by Barium Steel Corp., Central's parent firm, earlier in the year. Charles Agnew has been appointed superintendent. Mr. Agnew was at one time superintendent of blast furnaces, Alan Wood Steel Co., Conshohocken, Pa.

Borg-Warner Splits Division

Ingersoll Steel Division of Borg-Warner Corp. has been reorganized into two independently operated manufacturing units.

One unit, with steel mills at New Castle, Ind., will retain the present name and will continue to produce stainless sheets and specialty alloy steels for automotive uses, farm implements and saws. The operation is headed by Harold G. Ingersoll, president and general manager.

The other unit, with plants in Chicago and Kalamazoo, Mich., will be called Ingersoll Products Division. It will manufacture truck wheel discs, washing machine tubs, bathtubs, steel sinks, furnaces, auto body stampings and forgings and storm windows. Robert S. Ingersoll is president and general manager.

Steel Mills Place Big Orders

Steel mill equipment orders involving large capital outlays are being placed with equipment makers as expansion plans jell. Some reported equipment awards aren't confirmed as yet but reported awards are usually confirmed in short order by official announcements.

Here's the picture late last week:

Mesta Machine Co., Pittsburgh, received contracts for an 80-inch hot mill and a 42-inch cold mill for the new U. S. Steel Corp. plant in the East.

E. W. Bliss Co., Canton, O., is said to have an order for three temper mills to be installed at the same location.

Slabbing mill contract hasn't been placed as yet but will probably go to United Engineering & Foundry Co., Pittsburgh.

United has orders for a hot strip mill from Armco Steel Corp. and a high speed rod mill from Continental Steel Corp. A similar rod mill for Jones & Laughlin Steel Corp. is reportedly going to United. Another order that is expected to be placed with the Pittsburgh equipment firm soon is for a 4-stand 4-high sheet mill to be built for Kaiser Steel Corp.

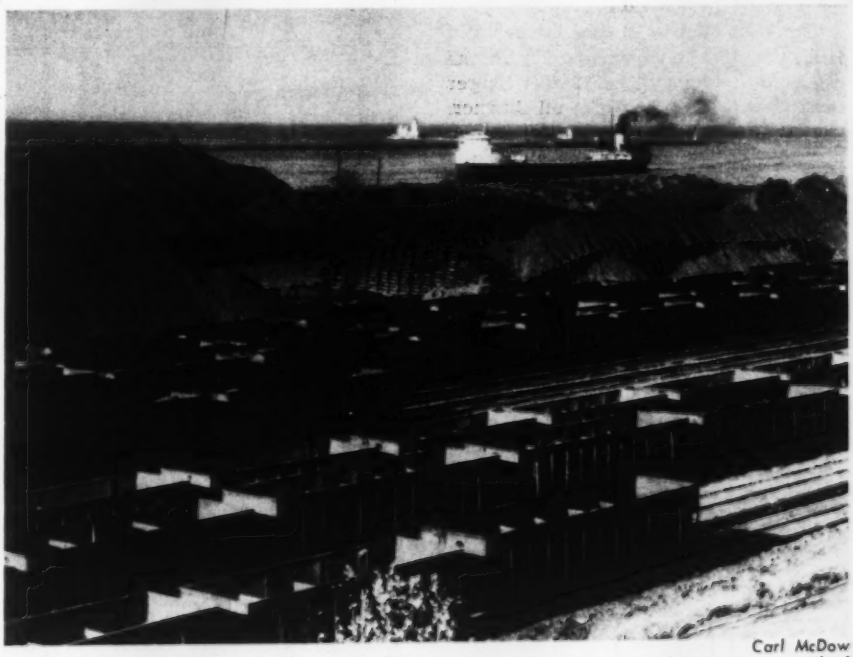
Steel Expansion: Fast, Far—with Optimism

THE STEEL INDUSTRY will continue to expand just as far and as fast as good judgment backed by a wide streak of optimism warrants. That assurance was given steel consumers last week by Charles M. White, Republic Steel president, speaking before the Economic Club of Detroit.

Mr. White, in apparent rebuttal to governmental criticism of underexpansion by the steel industry, pointed out that the industry historically expanded more rapidly than government planners believed advisable.

Growing Pains—Many basic problems must be solved before the industry builds new capacity, Mr. White says. These include raw materials, manpower, financing and "product mix."

The industry is spending tremendous sums to lick the raw materials problem and are beginning to reap the results of years of painstaking



Carl McDow

REAP THE WILD WIND: Usually in late October a mountain of iron ore is piled on Cleveland unloading docks, making it impossible to see approaching lake freighters. That was not the case this year. Because of the 1949 steel strike and the late start for the 1950 season, lake vessels are hard-pressed to get enough ore down to lower lake ports to last steel mills until the 1951 season opens. On Nov. 1, there were only 486,000 tons of ore piled at this Cleveland dock. At the same time in 1948, there were 544,000 tons. Compare those figures with the 929,000 tons that were piled up here Dec. 12, 1942

research and more liberal spending.

Manpower, now scarce, is needed not only to produce more steel but to cut it up and fabricate it. "It would take 1.5 to 2.5 million additional workers to utilize another 20 million tons of steel. Where are we going to get them?"

It Takes Money — Inflation has vastly complicated the financing problem. New steel plants today cost more than $300 a ton, compared with about $50 a ton when most of the present plants were built.

"How much high cost expansion can we undertake and still keep steel prices at a reasonable level?" asks the Republic president.

To avoid terrifically high overhead, the steel industry has chosen to "round out" its present plants rather than build complete new facilities. By this means, Republic is adding 672,000 tons of capacity at Cleveland at a cost of slightly more than $100 a ton, or one-third the cost of completely new facilities.

Tenth Ore Carrier Ordered

American Shipbuilding Co., Cleveland, got the contract to build a 690-foot iron ore carrier for M. A. Hanna Co., Cleveland. The vessel will be the largest and costliest ship ever built on inland waters. It's the tenth big freighter to be ordered for the Great Lakes in the last few months (See STEEL, Sept. 18, p. 80).

The boat will be a coal burner and will operate almost exclusively in the ore trade. She will be 12 feet longer than Inland Steel Co.'s oil burner, the *Wilfred Sykes,* now the lakes' biggest boat. The new ship will have a capacity of over 19,000 tons at 24-foot draft.

Rubber Plant Being Readied

Firestone Tire & Rubber Co. engaged the Chemical Plants Division of Blaw-Knox Co. to reactivate the 30,000-ton synthetic rubber plant at Louisville, Ky. The plant was completed in 1943 by Blaw-Knox for the Defense Plant Corp. to help meet World War II's need for rubber. In 1947, it was placed in standby condition as reserve capacity for future synthetic rubber needs.

The government's Rubber Reserve Corp. assigned to Firestone the overall responsibility for reactivating the plant. Firestone awarded Blaw-Knox the contract for reconditioning the machinery, checking the instruments and equipment and making the plant ready for production. The project is expected to be completed by the first of the year. After reactivation, production operations will be handled by the Kentucky Synthetic Rubber Corp.

Merger Considered

Minnesota Mining & Mfg. and Carborundum are thinking about getting together

CARBORUNDUM Co. and Minnesota Mining & Mfg. Co. are considering merging, officials of both companies reveal. H. K. Clark, Carborundum president, says all negotiations are based on an understanding that there will be autonomy of operations.

Under the proposed merger each of Carborundum common stock would be changed for two shares of Minnesota Mining common stock, which will result from the previous four-for-one stock split. That would be equivalent to one-half share of the present outstanding Minnesota stock for each share of Carborundum. So say W. L. McKnight, chairman of Minnesota Mining, and Mr. Clark.

Carborundum produces grinding wheels, sharpening stones, polishing grains and powders, coated abrasive papers and cloths, refractory material, nonmetallic heating elements and resistors. Minnesota Mining manufactures "Scotch" tape, coated abrasives and other products.

65 BELOW: To test its products under sub-zero conditions Hobart Brothers Co. started operating its new facilities at Troy, O. In this special cold room—with an intermediate chamber to reduce cold losses—Hobart arc welders are tested in varying temperatures ranging down to 65 degrees below zero. A technician is about to start tests on a 30-kilowatt generator

Smith Co. Buys R-S Products

Purchase of R-S Products Corp., Philadelphia, by S. Morgan Smith Co., York, Pa., hydraulic turbine and valve manufacturer, became effective Dec. 1, it was announced by Beauchamp E. Smith, president.

Terms of the purchase were not disclosed, but the Philadelphia firm reported annual sales in excess of $1 million.

R-S Products Corp. has orders on its books for an unfilled backlog of orders over $1,250,000. It manufacturers butterfly valves that are widely used for controlling the flow of many types of fluids in process industries, in power plants and in water supply systems. Combined operations of the two companies will permit sales of valves of all sizes. R-S also manufactures large industrial heat treating furnaces. Mr. Smith says the present management of R-S—W. E. Borbonus, president, and D. W. Hopkins, executive vice president—will be retained along with the five-man board of directors.

Powdered Metals Expanding

Powdered Metal Products Corp. of America, Franklin Park, Ill., finished its plans for a new plant addition at its Belmont avenue plant. The addition will double present production capacity. Ground was broken last week. Powdered Metal Products has a broad line of custom-made parts like cams, bearings, filters, electronic cores and gears. It also supplemented these recently by adding standard gears and self-lubricating bearings.

Harris Plant Rebuilding

Benjamin Harris & Co., Chicago Heights, Ill., smelter and refiner of brass and bronze ingots, expects to have in operation by next March or April the new plant it has under construction as replacement of the facilities destroyed by fire on last May 8.

The plant, which is costing approximately $750,000, incorporates new equipment which will increase former smelting capacity by 15 to 25 per cent. In the meantime, the company continues to service its customers.

More Propane-Powered Busses

Wichita Transportation Corp., Wichita, Kans., just ordered ten more Twin Coaches for operation on propane. In May it ordered and became one of the nation's first users of propane-powered busses. Busses were sold by Twin Coach Co., Kent, O.

Steel Prices, Wages Go Up

Steelworkers get average increase of 16 cents an hour, with a range from 12½ to 28 cents. Advance on finished steel averages $5.50 a ton, ranges from $3 to $16

METALWORKING companies are starting to refigure their costs on the basis of higher steel prices and possible wage increases following a simultaneous increase in steel wages and prices last week.

Steel products now cost an average of 5½ per cent or about $5.50 a ton more than they did before Dec. 1. Increases in the various steel products range from $3 to $16 a ton.

These advances barely cover higher costs to steel producers resulting from a wage increase averaging 16 cents an hour. Heavy increases in raw materials and other goods and services purchased by the steel producers are not reflected in the new steel prices. The increase is less than had been anticipated.

Wages

U. S. Steel Corp. set the stage for the higher price and wage levels when it agreed to grant the union a wage increase ranging from 12½ cents to 28 cents an hour. The average increase amounts to 16 cents an hour, slightly less than 10 per cent of the average hourly earnings of steelworkers in recent months.

The settlement is practically identical with that predicted by STEEL seven weeks ago when negotiations got underway (STEEL, Oct. 16, p. 17).

Under the new rate schedule, Class 1 workers (sweepers etc.) get an increase of 12½ cents an hour from $1.18½ to $1.31. Class 32 workers, the highest paid, get a 28-cent increase from $2.58 to $2.86 an hour. The step-up differential between the classes is increased from 4½ to 5 cents an hour.

The differential between northern and southern workers is decreased in the new schedule by 4½ cents per hour. The differential now is 10 cents an hour; formerly it was 14½ cents.

Appropriate adjustments in compensation for salaried workers will be made and will be effective as of Dec. 1, the effective date of the wage increase.

U. S. Steel figures the wage increase will cost its subsidiaries $125 million a year. Based on current tonnages, that is equivalent to about 5½ per cent of the present average prices of a ton of steel.

The new wage agreement does not affect other provisions of the labor contract which continues in effect until Dec. 31, 1951.

The United Steelworkers will ask 16-cent increases from metalworking companies with which it has contracts, but such demands will be negotiable.

Prices

The steel price increase averages less than three-tenths of a cent a pound.

On the basis of 75 million tons of finished steel annually, the indicated increased costs to steel consumers would be $412 million annually.

Translated into steel required for various end products the increased steel prices will amount to about 2 cents for a $22 automatic toaster, 32 cents for a washing machine, 70 cents for a gas stove, $4 on a farm tractor, $9 on a medium price automobile and about $20 on a $10,000 home.

Commenting on the advance, Ben Fairless, U. S. Steel president, said:

"These price increases reflect only the increases in employment costs that are to result from the labor settlements. Heavy increases in the costs of the goods and services that United States Steel must purchase from others have already occurred this year and further cost increases of this kind may be encountered in the future primarily as the result of higher prices occasioned by increased wage rates under the many new labor contracts negotiated in various industries during recent months. The new price schedules of United States Steel, however, do not reflect any increases in the costs of purchased goods and services which have already taken place."

Carnegie-Illinois

Carnegie-Illinois Steel Corp., subsidiary of United States Steel Corp., announced the following new mill prices within the range of sizes, grades, finishes, and specifications produced at its plants.

Delivered prices reflecting actual transportation charges to destination will be also quoted to customers. The prices apply on carload lots and became effective with shipments on and after 12:01 a.m., Dec. 1, 1950.

(all figures cents per pound, unless otherwise denoted)

Carbon steel products:	Cents Per Lb	Increase Dollars Per Ton
Blooms, billets, slabs—forging	$66 per net ton	$3.00
Blooms, billets, slabs—rerolling	$56 per net ton	3.00
Skelp	3.35	3.00
Bars and small shapes	3.70	5.00
Concrete reinforcing bars (new billet)	3.70	5.00
Standard structural shapes	3.65	5.00
CBS (including CBL, CBJ and CB sections)	3.65	5.00
Bearing piles (CBP sections)	3.65	5.00
Sheet piling	4.45	5.00
Plates	3.70	4.00
Standard tee rails—No. 1 O.H.	3.60	4.00
Standard tee rails—No. 2 O.H.	3.50	4.00
Standard tee rails—all No. 2 O.H.	3.55	4.00
Light rails	4.00	5.00
Tie plates	4.50	6.00
Joint bars for standard rails	4.70	6.00
Hot rolled sheets (18 ga. and heavier)	3.60	5.00
Cold rolled sheets—(commercial quality)	4.35	5.00
Galvanized sheets		
Regular—10 gage	4.80	8.00
Culvert—16 ga. copper bearing	5.60	8.00
Electrical sheets (electrical grade—cut lengths, 22 ga. price base)	7.25	11.00
High strength steel products:		
USS Cor-Ten:		
Standard structural shapes	5.50	7.00
CB sections	5.45	7.00
Plates	5.65	4.00
Bars and small shapes	5.55	7.00
Hot rolled sheets	5.40	5.00
Cold rolled sheets	6.55	5.00
Alloy steel products:		
Blooms, billets, slabs—forging	$70 per net ton	4.00
Ingots	$54 per net ton	3.00
Hot rolled bars	4.30	7.00
Bar shapes	4.55	7.00
Plates	4.75	7.00
Structural shapes	4.35	6.00
Strip, hot rolled	5.50	8.00

The following new prices are quoted on Man-Ten and stainless steel products:

USS Man-Ten:	
Standard structural shapes	4.60
CB sections	4.65
Plates	4.75
Bars and small shapes	4.50
Hot rolled sheets	4.45
USS abrasion resisting:	
Bars and small shapes	4.85
Plates	4.85
Hot rolled sheets	4.75
Stainless steel (18-8) products:	
Billets and slabs—rerolling	19.75
Billets—forging	26.25
Bars, hot rolled and cold rolled	31.25
Plates	33.00
Sheets	41.00
Structural shapes	31.25
Strip, hot rolled	28.00

Prices are subject to the seller's lists of extras and deductions and standard conditions of sale in effect at time of shipment.

All sales are subject to seller's prices in effect at time of shipment.

American Steel & Wire

American Steel & Wire Co., subsidiary of United States Steel Corp., announced the following new mill prices on the below named products, within the range of sizes, grades, finishes, and specifications produced at its plants.

Delivered prices reflecting actual transportation charges to destination will be also quoted to customers. These prices will apply on carload lots and

(*Please turn to page* 163.)

Be Wise: Standardize

That's the theme of an American Standards Association conference in New York

STANDARDIZATION is an industrial tool that may help America get guns as well as a reasonable amount of butter. That was a theme at the National Standardization Conference in New York last week, sponsored by the American Standards Association at its annual meeting.

To the Quick—Brig. Gen. Donald Armstrong, U. S. A. (Ret.), president, U. S. Pipe & Foundry Co., Burlington, N. J., described the present world situation as a race between manpower and raw materials on the one hand, and factories, know-how and morale on the other.

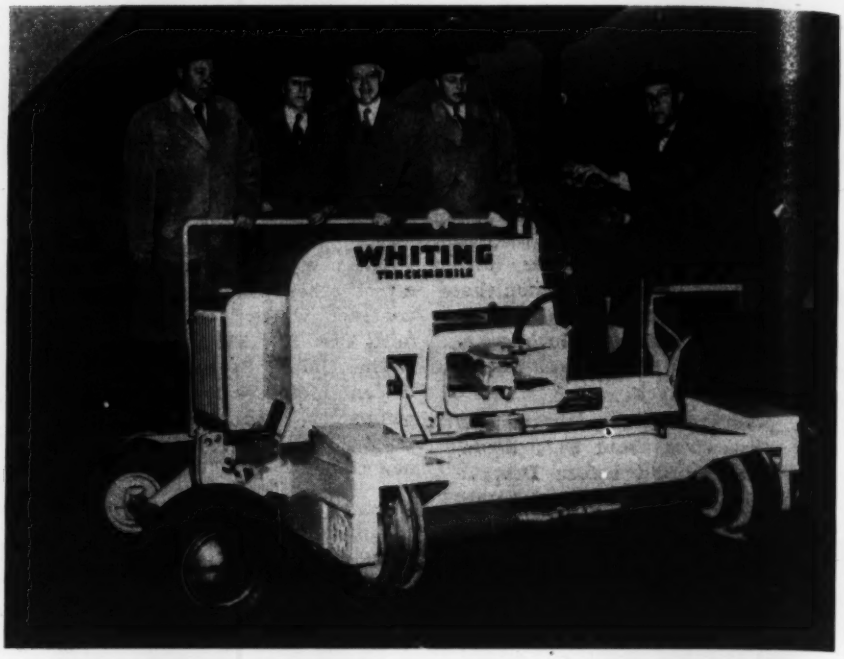
"The management skill known as standardization," he stated, "is one of the most important reasons that we in the United States, despite our numerical inferiority, can look forward with some hope of the future."

Waste Control—Warning that the country must make the best possible use of everything it has as it is "rapidly passing from the have to a have-not nation." R. Adm. M. L. Ring, U. .S. N., director of supply management for the federal government, states that this country can never again afford to fight another war with the same degree of waste that it fought the last two. Every possible effort must be made, he says, to standardize every single function of supply management by the federal government. At present about 81 per cent of current procurement by the military establishment is being handled by a single procurement agency or some form of joint purchasing.

Discussing work being carried on to create a single federal catalogue, he says that about 1 million items have been described and identified with the total expected to reach 2.5 million to 3 million.

Alternate Uses — Roger E. Gay, president, Bristol Brass Co., Bristol, Conn., proposes a means of producing required war material without cutbacks in civilian goods so drastic that they would disrupt the economy. He proposes national standardization on a large scale to permit broad interchanges of civilian and national defense items, thus preventing needs for duplication in special production work. There are too many engineers, both in industry and in military services, who want something special, he says.

Standardization activities of the association in the past year include: Participation in international standardization; approval of standards for steel electric conduit, industrial fasteners, small tools and machine tool elements, and gears; and approval of a standard for gaging inpection of ball and roller bearings.



IT SPOTS, IT SWITCHES, IT HAULS: That's what Whiting Corp.'s Trackmobile does. It is a "midget" sized gasoline vehicle used to push around railroad cars. It weighs only 6000 pounds and develops a maximum draw-bar pull of 7350 pounds. Operating from either a track or the ground, it can be changed from one to the other in 30 seconds. Stevens H. Hammond (left), president of Whiting, Harvey, Ill., demonstrated its versatility to railroad executives and industrialists

New Bosses — Thomas D. Jolly, vice president, Aluminum Co. of America, Pittsburgh, was re-elected to his third term as president of ASA. Re-elected also were: Harold S. Osborne, chief engineer, American Telephone & Telegraph Co., New York, as vice president; Walter C. Wagner, Philadelphia Electric Co., Philadelphia, as chairman of the Standards Council; and J. R. Townsend, materials engineer, Bell Telephone Laboratories Inc., New York, vice-chairman of the council.

Four new directors are: George B. Butterfield, secretary, Hartford Accident & Indemnity Co., Hartford, Conn., representing the National Safety Council; Charles W. Bryan Jr., president, Pullman Standard Car Mfg. Co., Chicago, American Society of Civil Engineers; H. S. Sizer, assistant to the director of design, Brown & Sharpe Mfg. Co., Providence, R. I., National Machine Tool Builders Association; and Charles E. Hodges, president, American Mutual Liability Insurance Co., Boston, National Association of Mutual Casualty Companies.

Two re-elected directors are: Earl H. Eacker, president, Boston Consolidated Gas Co., Boston, representing the American Gas Co.; and Lester S. Corey, president and general manager, Utah Construction Co., Ogden, Utah, and San Francisco, director at large.

Loans for Defense

Need a loan to carry on defense production?

If you do and can't get it from private financial sources you might apply to the government for a Reconstruction Finance Corp. loan. Application blanks are available at field offices of the Department of Commerce and other government agencies.

Funds obtained through such a loan must be used for expansion of capacity, development of technological processes or production of essential materials. The funds will be loaned only if it can be shown that their use will speed production and deliveries or services to aid in carrying out national defense.

Spent for Defense: $8.1 Billion

Major materiel and supplies ordered by the Department of Defense in July, August, September and October have a total value of almost $8.1 billion.

Orders placed were for: Aircraft, $4357 million; ammunition and guided missiles, $755 million; engineer supplies and equipment, $159 million;

clothing and equipage, $163 million; electronics and communications, $368 million; petroleum, oils and lubricants, $122 million; ships, $95 million; subsistence, $302 million; tank-auto $906 million; transportation equipment, $7 million; weapons, $309 million; other equipment and supplies, $405 million; and construction, $144 million.

October Pig Iron Output at Peak

The nation's blast furnaces produced 5,924,427 net tons of pig iron, ferromanganese and spiegeleisen in October, says the American Iron & Steel Institute. It's an alltime record.

Output in the first ten months of this year totaled 54,404,297 tons, compared with 46,253,857 tons in 1949. The 1949 production was curtailed by the steel strike. The September, 1950, output was 5,697,123 tons. The southern district produced at 107.3 per cent of capacity in October. The eastern area produced at 103.6 per cent of capacity.

Workweeks Getting Longer

Lengthened work-weeks helped the nation attain a postwar peak in production in October.

By the middle of that month the work-week of the nation's factories was extended to an average of 41.4 hours, the highest since December, 1945, the U. S. Bureau of Labor Statistics reports. In mid-September the workweek was 41 hours.

Increased overtime and higher wage rates nudged up average hourly earnings nearly 2 cents, to $1.497 in October. This pushed up average weekly earnings of production workers in manufacturing establishments from $60.68 in September to $61.98 in October.

The average weekly hours of work advanced about 4 per cent between January and October. This gain is in contrast with the relatively unchanged work-week during 1949 when the industrial pace was slower.

In the durable goods industry division, weekly hours averaged 42.2 in October, a peak for the postwar period. With virtually all durable goods industry groups reporting some increase, average weekly hours rose by half an hour over the month. Among the groups showing significant advances are ordnance and accessories, primary metal, and electrical machinery industries.

Largely because of the longer workweek, average weekly earnings in the durable goods division increased by nearly 2 per cent over the month, to $66.34 in October. The increase also reflected a slight rise in wage rates.

NSRB Studies Conservation

Delegates to ASME's meeting hear the mobilization agency is recreating a conservation unit

AS PART OF a drive for conservation in mobilization planning, the National Security Resources Board will recreate a Conservation Co-ordinating Committee such as operated during World War II. This was revealed last week during the 1950 annual meeting of the American Society of Mechanical Engineers in New York.

Howard C. Coonley, chief conservation planning specialist for the NSRB, told the ASME that the committee will initiate and develop unified programs of conservation in the mobilization effort.

Getting Set—The committee will include representation from all three divisions of the Department of Defense, the Munitions Board, the National Production Authority and other government agencies concerned with facilitating manpower and production.

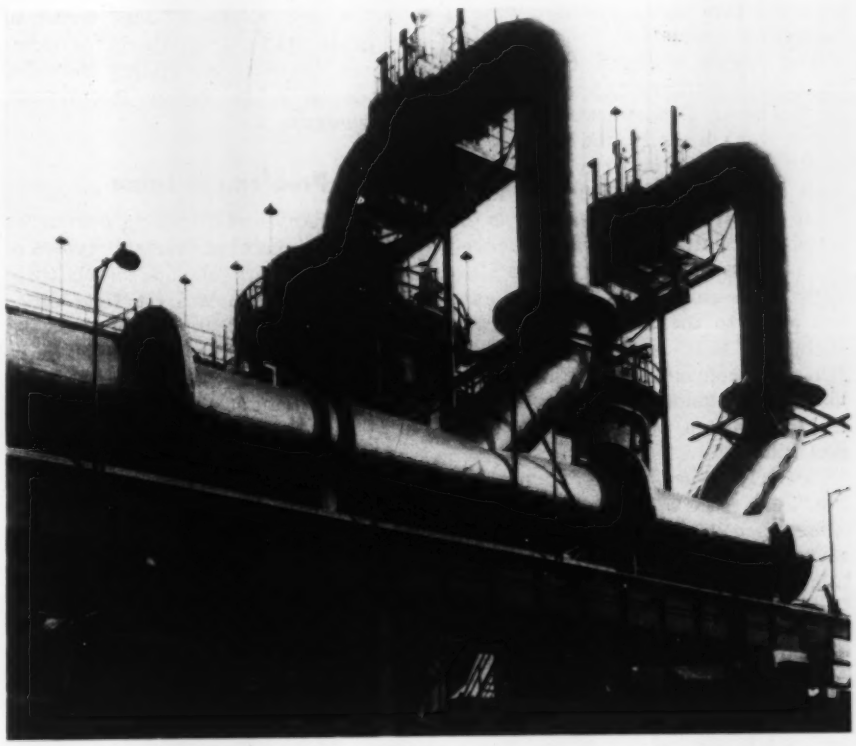
Mr. Coonley outlined six categories of conservation: 1. Standardizations, specifications and simplification, 2. Measures to determine and safeguard supplies of critical materials, 3. Development of substitutes wherever necessary and possible, 4. Salvage and savings at the source, 5. Cataloging of supplies under a system of standard identification to avoid duplication and waste, 6. International co-operation in conservation measures.

Too Old to Retire — Mr. Coonley pointed out that management should re-appraise theories of the mandatory retirment age for personnel. A recent survey indicates the useful years of life of men and women workers are rapidly increasing. Within the next generation, the period of efficient service will have increased by 15 years over earlier estimates.

The need for standardization and quality control throughout industry is emphasized by the fact that American manufacturers make $3 billion worth of faulty products a year.

New Officers—Newly elected president of the ASME is J. Calvin Brown, Los Angeles engineer and patent attorney. He succeeds James D. Cunningham of Chicago.

Regional ASME vice presidents elected at last week's meeting are Henry Reginald Kessler, manager, Republic Flow Meters Co., New York; Stephen Dewey Moxley, vice president, American Cast Iron Pipe Co., Birmingham; John T. Rettaliatta, dean of engineering, Illinois Institute of Technology, Chicago; Carl J. Eckhardt, University of Texas.



SIGN OF BETTER TIMES: Smokeless smoke stacks are generally a sign of poor times. Not so at McKeesport, Pa., these days. Business is booming and new improvements are in evidence—including these five new smokeless stacks at National Works of U. S. Steel's National Tube Co. The big 9-foot pipes feed gas from the blast furnaces into these new gas washers, where the gas undergoes a multiple water spray that washes out flue dust. Afterward, electrostatic precipitators further reduce the dust content of the gas

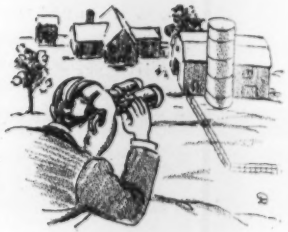
Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Wants Guns, Gets Butter

Read Those Orders!

Tracking Down Skilled Labor



Checking Farm Steel Use

"Utterly incompetent. Disgusting." Those are the appraisals made of the administration's failure to use a more realistic approach to the war

WILL MacARTHUR'S "crisis" message of Nov. 28 prove to be that certain something that was needed to galvanize our rearmament program into life? That's the big question in Washington — particularly among men high in the defense and security agencies. They've long been restive, especially since our troops moved into Korea in June. Despite the precarious situation precipitated by that step, relatively little has been done to improve our defense position. The prevailing opinion among those men is that never before has the United States been confronted with so dangerous a situation.

The trouble, of course, originates in the administration's disposition to rely on the State Department to keep us out of war via the United Nations, the North Atlantic Pact, etc. Of a piece with White House thinking about what constitutes first measures is the legislative slate the President handed to Congress a few hours before MacArthur's message. The President gave top place to the Alaska and Hawaii statehood bills, a supplemental defense appropriation of another $10 billion, extension of the rent control law, and a $4-billion excess profits tax.

"Utterly incompetent," "disgusting," are some of the milder expressions used by capable men in defense spots when they talk about the administration's failure to use them in an all-out drive to meet the rapidly gathering war threats more realistically. "Too much domestic politics as usual," they say.

You've Got To Read the Regs . . .

While employees of the National Production Authority are patient men who try to answer all questions put by visitors, it is not smart to come to NPA on priority problems without first having read the priority orders. To understand the priority system as it has been formulated to date, it is necessary to read five orders — Regulation 2, and Delegations 1, 2, 3 and 4. Reg. 2 lays down the priority rules and the definitions of terms.

Delegations 1 to 4 outline the authority to the agencies empowered use DO ratings: Department of Defense, Atomic Energy Commission, National Advisory Committee for Aeronautics, and the Coast Guard. Anybody can get on NPA's list and get those orders as well as all future orders and releases. Just write to "United States Department of Commerce, Division of Printing Services, Attention E. E. Vivian, Room 6225, Washington 25."

Labor Problems to Labor . . .

The many metalworking companies that are short of certain types of skilled workers should direct these problems to the nearest field office of the Department of Labor. At a conference of its field supervisors in Washington, the Labor Department's Bureau of Apprenticeship mapped out certain services it can offer to help out in such cases. By working with manufacturers and with state, city and private educational authorities, it hopes to set up programs wherever needed to turn out workers with needed skills. A strong effort will be made to encourage manufacturers to train more apprentices. Labor is prepared to go to bat for deferment of apprentices when such action is needed.

How Much Steel on Farms?

Despite the fine statistical performance by the American Iron & Steel Institute and the Commerce Department on iron and steel and their fabrications, government statisticians who are trying to figure how much steel would be required to maintain the domestic economy in a total war mobilization are complaining. Chief complaint is the absence of information about end-uses of steel going to distributors. The Agriculture Department especially has difficulties. It says it has fairly good information about steel going into farm machinery, hand tools and other products sold to the farmers. But it has discovered no satisfactory method of determining how much steel is in other purchases that the farmer makes from hardware, general and agricultural supply stores. In particular, it has no idea how much tonnage of nails, wire, galvanized roofing and siding, chain, reinforcing mesh, pipe, etc., the farmer is buying.

A $1 Pay Cut . . .

Approval was given by the President for employment "without compensation" of industry men for the purposes specified in the Defense Production Act. Such men, under the White House interpretation of the act, may be sworn in, after security clearance, as full-fledged government employees while at the same time continuing to draw their salaries from their private employers. Says a spokesman: "This is tantamount to a revival of the dollar-a-year arrangement of World War II excepting that the salaries of dollar-a-year men have been cut $1."

Machine Tool Exports Surge . . .

Export demand for American machine tools has taken an upward surge, say spokesmen of the Office of International Trade who validate shipping licenses. Foreign buyers generally are eager to obtain high-production tools of latest design before the rearmament program shuts off shipments from the United States. The improved demand comes from all over the world—aside from Iron Curtain countries—and particularly from Latin America, Australia and South Africa.

Packaging Exposition Next April

The American Management Association will sponsor its 20th annual National Packaging Exposition Apr. 17-20, 1951, at the auditorium in Atlantic City, N. J. Machines, equipment and services used in packaging, shipping and packing will be on display. AMA has presented the National Packaging Exposition annually, with the exception of one war year, since 1931. In the first show, 34 exhibitors, using 3000 feet of floor space, showed their products and services to fewer than 2000 visitors. Last year, at the 19th exposition, 240 exhibitors used 75,000 square feet of floor and exhibit space; attendance exceeded 19,000. Next year's show, says Clapp & Poliak, which is handling the arrangements for the exposition, will involve more space and more exhibitors.

NEMA Elects Higbee President

C. W. Higbee, manager of the electrical wire and cable department of United States Rubber Co., New York, was elected president of the National Electrical Manufacturers Association. He succeeds Charles T. Lawson, a vice president of the Kelvinator Division of Nash-Kelvinator Corp., Detroit.

These vice presidents were named at NEMA's 24th annual meeting: Arthur A. Berard, president, Ward Leonard Electric Co., Mount Vernon, N. Y.; J. H. Jewell, vice president, Westinghouse Electric Corp., Pittsburgh; J. F. Lincoln, president, Lincoln Electric Co., Cleveland; and R. E. Murphy, vice president in charge of sales, I-T-E Circuit Breaker Co., Philadelphia.

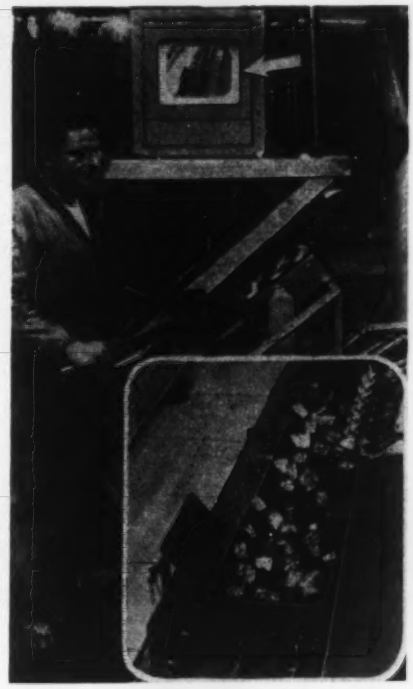
Hammarstrom Joins NPA

Eric W. Hammarstrom, manager of the Building Products Section of Reynolds Metals Co., Atlanta, Ga., joined the Building Products Division of National Production Authority in Washington. He was granted a leave of absence to assist the government agency during the emergency. In World War II, Mr. Hammarstrom served in the Building Products Division of the War Production Board.

Die Supply Holds Open House

Last month over a thousand customers and friends of Die Supply Co. attended an open house at the company's new plant, 1400 Brookpark Rd., Cleveland. Hosts were members of the Fitzsimmons family, long active in the tool and die industry. Their plant has complete facilities for stocking and handling heavy steel plate and other raw materials. Die Supply also can handle finished die sets, pins, springs and related items. At the raw material end of the plant are facilities for flame cutting, welding and normalizing. Between that area and the finished material stock area is a machine shop for manufacture and reconditioning die sets of all sizes.

Officers of the company are W. H. Fitzsimmons, president; J. T. Fitzsimmons, vice president and sales manager; Warren Fitzsimmons is works manager.



EXCLUSIVE SHOWING: The operator of the scrap baler is the sole spectator of a continuous television show. TV, at Fisher Body's new Pittsburgh plant, allows him to see bales as they drop into waiting gondola cars outside the building. He is able to load the car evenly and bring up an empty car with his remotely controlled car-puller. The arrow points to the television screen which shows when a car is loaded. The inset photo shows an enlarged picture of what he sees on the TV screen

Magnesium Association Officers

Officers of the Magnesium Association, elected at the sixth annual meeting, are: President, A. W. Winston, Dow Chemical Co., Midland, Mich.; vice president, W. C. Murray, Utica Radiator Corp., Utica, N. Y.; treasurer, Otis E. Grant, Superior Bearing Bronze Co., Brooklyn, N. Y.; assistant secretary, Martha I. Hansen, the Magnesium Association, New York.

Eutectic in Tenth Year

Now under construction at the site of Eutectic Welding Alloys Corp.'s No. 2 plant at Flushing, Long Island, N. Y., is a new engineering services building. First is scheduled for completion early next year. It will furnish additional space for Eutectic's long-range continuous welding development research program and house engineering, technical and administrative personnel.

Eutectic will celebrate its tenth anniversary this month. Its story is hardly an ordinary industrial success story: After only ten years of being in business Eutectic now serves about 78,000 plants throughout the country. In its new engineering services building will be conference rooms for customers' representatives from those 78,000 plants.

Caterpillar Allocating Equipment

Caterpillar Tractor Co., Peoria, Ill., has organized a voluntary allocation program to distribute equitably the heavy machinery it manufactures next year. Right now the program applies only to track-type tractors, cable controls, bulldozers and motor graders.

Lubricate by Air

Friction—ancient enemy of moving mechanisms—is licked by use of air bearings in guided missile production at North American Aviation Inc.'s aerophysics department, at Inglewood, Calif.

Believed to be the first to make practical use of friction-free air bearings, North American undertook extensive development in the field of air bearings as part of its guided missile research.

Air bearings are lubricated by a film of air 0.001-inch thick, have no starting friction. In comparison, the friction of a motor car engine's parts eats up about 15 per cent of the engine's horsepower. A shaft mounted on air bearings will turn at the touch of a feather, and continue turning long after a similar shaft mounted on conventional bearings has stopped due to friction. Friction-cutting secret of air bearings are the bearings themselves, which slide on molecules of air forced into the bearing race through tiny capillaries 0.003-inch in diameter. Technicians working on bearing races use powerful lenses in their work.

Sweden . . . Korea Is Economic Spur to Both Countries

Swedish economic stability continues despite labor shortages and difficulties in shifting to an industrial economy and finding more markets

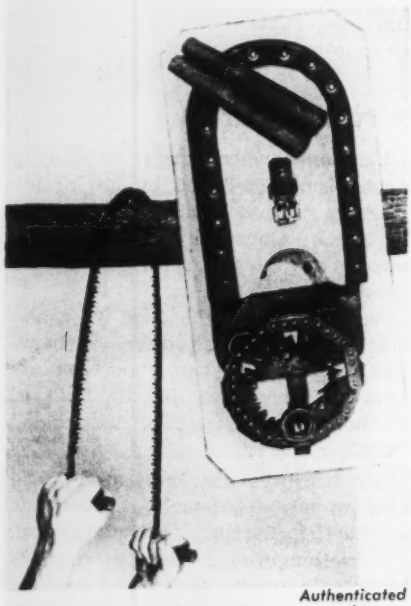
THE SWEDISH economy continues as one of the most stable in Western Europe. It survived devaluation of the kroner in late 1949. Its foreign trade has soared since the outbreak of the Korean war.

So great have been expenditures for new plant and equipment that the government has had to clamp on investment curbs.

Transition — The nation in 1950 made progress in transforming itself from an agricultural and forestry nation to one predominately industrial. Her major exports before the war were forest products. Her forests are being depleted, and she is trying to switch more to finished manufacturing of specialty steels, precision industrial equipment and products.

Those transitional problems in manufacturing are largely responsible for Sweden's chronic labor shortage. Industrialists fear the worst when the wage-freeze ends this month. The manpower scarcity is particularly bad in metalworking fabricating plants and shipyards.

WITH this issue, the editors of STEEL begin a series of articles on what happened in 1950 and what's likely to occur in the future economically for the major Western European countries. Next week, Dec. 11, we will deal with Belgium, Luxemburg and France. Western Germany and Great Britain will be studied Dec. 18. A summary of the situation in Western Europe will appear Dec. 25. Complete iron and steel statistics for all industrial nations of the world will be carried in our 1951 Metalworking Yearbook issue, Jan. 1.



Authenticated

KEEN IDEA: Swedish forests are being depleted rapidly; so the country it switching from a forest economy to such things as finished manufacturing of specialty steels. A good example of the change being made — and suggestive of the gradual change in Swedish thinking — is this flexible saw, 44 inches of strong, flexible steel for cutting down trees and stumps. It coils compactly into a handsome aluminum case, complete with brass-studded leather trim

Labor Pool—Helping the labor situation but still in the experimental stages is a labor pool plan for Scandinavia in which Sweden is participating. Other participants are Denmark, Norway and Finland. The nations, with a combined population of 18 million, are removing visa and passport barriers so their citizens who want to try their job luck in another Scandinavian country can do so.

Cause and Effect—The labor shortage is responsible for Sweden's mediocre production showing in 1950. Output exceeded the 1949 levels, but some new capacities finished in 1950 could not be utilized. Pig iron output should have increased by 10 per cent in 1950 to nearly 1,050,000 net tons. It jumped only 8 per cent. Swedish steel production in 1950 exceeded 1.5 million tons, better than the 1949 record but not as much better as expected.

The largest steel consumers in Sweden are metalworking fabricators who use about half the nation's entire output. Their activity declined in the first half of 1950, but bounded back in the second when the Korean war started. Builders of automobiles, tractors, electrical equipment and ships experienced the greatest boom in 1950. During the first eight months of 1950, the number of registered new cars amounted to 38,000 compared with 8000 for the corresponding period of 1949. Some 80 per cent of that gain was imported European cars, but Swedish manufacturers are growing. The auto industry, relatively new to the country, will expand some more next year.

For Two Years — Swedish ship builders have enough work to keep them active for the next two years. The situation sharply contrasts with conditions in late 1949 and early 1950 when builders were bracing for a depression. Korea, of course, accounts for the change.

Materials shortages, as well as a manpower scarcity, are the only factors that darken the shipbuilding picture. Builders don't have enough steel plates and sheets.

Bulwark in Building — Residential and industrial construction accounts for about a third of the Swedish consumption of iron and steel products. Despite government controls on building, activity has been high. Industrial expansion caused most of the business in the first three years after the war. Then industrial building gave way to residential. In early 1950 residential construction gave way to projects for schools, hospitals and roads. Now residential and industrial demand is up again, to such an extent that government controls are going on once more.

The demand for steel in 1950 went up much faster than increased domestic production. Greater imports of steel made up much of the deficit, although the government had to help finance some foreign deals when overseas prices soared. Belgian, French and German steel products, upon which Sweden is dependent, went up in price as much as 35 per cent in the fall of 1950. Swedish steel quotations rose only 5 per cent in 1950.

Up and Down—The difference of 25 to 30 per cent between world and domestic market prices tends to raise exports and decrease imports. In the first eight months of 1950, exports of pig iron amounted to 24,000 tons compared with 22,000 tons for the same period in 1949. Total exports of iron and steel products in the first eight months of 1950 were 137,000 tons compared with 122,000 tons in the same 1949 period. Iron and steel imports were up a little in 1950 over 1949, but only because of a bulge after Korea. In the first eight months of 1950, steel imports were actually below the 1949 level for the same period—634,000 tons compared with 692,000 tons.

Before the war Sweden's economy was closely tied to Germany's. Swe-

the War Will Continue To Boost 1951 Output . . . Italy

Prospects are much improved in Italy as expenditures for new plants and equipment mount and production rises. ECA was the big factor

den's exports, particularly of iron ore, are more diversified now. Before the war, Germany imported 75 to 80 per cent of Sweden's total ore production. The Ruhr today still uses the ore, but Britain and Poland are large buyers, too.

Big Job—The task of diversifying the Scandinavian country's foreign trade is complicated by the large differences between low Swedish home prices and foreign quotations. To try to equalize the situation, the Swedish government is now in the position of a man with a bull by the tail. It has built up an elaborate system of subsidies on import goods.

The labor shortage, transition to an industrial economy and greater diversification of foreign trade are among Sweden's major problems. She hasn't solved them completely, but she's well on the way to a solution, helped by long years of peace. The difference between her and Western European countries who have been at war is not as pronounced as it was a year ago, but the benefits of permanent peace are still abundantly clear in Sweden.

BRIGHT PROSPECTS: Italy hopes that 1951 will be its best year since the war. Many factors have helped in the rebuilding of the nation (see story this page). Its metalworking industry is a high cost proposition that is keeping its domestic markets only with the help of tariffs. One of the bulwarks of its present boom is residential construction. Here, a commercial structure is being reconstructed. It is a big department store in the shadow of the Milan cathedral

ECA, THE RELATIVELY stable Italian government, the Korean war and rearmament—those factors are combining to improve Italy's economic prospects.

ECA allocated the nation $1057 million from April, 1948, to June, 1950, but only $389.1 million of that from June, 1949 to June, 1950. Despite the decline in ECA allotments, they may make a disproportionate contribution to long-term recovery because 43 per cent of the money has been for capital equipment to permit Italians to increase markedly their equipment and machinery purchases.

Silent Partner—That has helped to push industrial production up about 10 per cent in 1950 over 1949, and the output is now comfortably above the 1938 level. In 1949 it was about 95 per cent of the 1938 volume; only 55 per cent in 1945. Much of the capital expenditures are going into the steel, auto and power industries.

The major participant in the steel program is the government-backed Finsider group of producers. Most of the steel production will be concentrated in integrated plants at Genoa, Naples and in Tuscany. Full capacities will be installed by mid-1952 when the Genoa facilities will have a basic steelmaking potential of 660,000 net tons annually, 440,000 tons at Naples and 330,000 tons in Tuscany.

Finsider accounts for about half of Italy's steel production.

More Cars — Capital expenditures are doing more to improve auto production facilities than to boost capacity; 1950 will be the first year since the war that the industry has even come close to using its full potential. Some 100,000 units will be built this year, compared with 68,000 in 1949 and 56,000 in 1948. Even that is not enough to meet domestic and foreign demand.

The industry is gaining an international reputation in automobile design with the sleek Lancia Aurelia and other models.

The expenditure program for hydroelectric power made such strides that the Italians needed to import no coal under the ERP program for 1949-50.

ECA allotments have also made possible, directly or indirectly, increased production of ball bearings, sewing machines, typewriters and calculating machines.

Big Help—Alcide deGasperi's Italian ministry is more kindly disposed to business than most other European governments. Of great aid will be its decision this year to fight inflation by more fundamental means than laws trying to hold back prices. It found such measures ineffective and is trying to encourage more capital expansion to boost production and thus keep prices down. The government now foresees that public and private capital investments will top $1 billion in fiscal 1950-51. Nearly 37 per cent of that $1 billion will be backed by public money. Much of the public and private investment money will go into residential construction, one of the bulwarks of the present economic boom.

The government will participate in a European steel and coal pool, but with these two "ifs": If Italy has equality of access to raw materials and if the iron and steel programs in the nation can be continued.

Shot Heard Around the World — The Korea war has helped boost exports from Italy, as it has everywhere else in Western Europe. As a result, more machine tools, ball bearings, electric generator motors and ships have been shipped out of the country this year than last. Rearmament of Atlantic Pact countries has not yet had much effect on Italian heavy industries, but it certainly will in 1951.

The Other Side of the Coin—Not all is rosy economically in the nation. Unemployment is still serious, mainly because of the steadily increasing population. Births are exceeding deaths and emigrations by 450,000 to 500,000 each year. Labor relations are strained. The Communists are still strong. Although the national income has nearly doubled since 1945 in terms of lire, it is still below 1938 when inflation is taken out. Competition for export markets is still strong, especially from Germany. Italy, a land poor in natural resources, is saddled with a high cost metalworking industry that in some cases can keep even its domestic markets only with the help of high tariffs.

But despite those handicaps, Italy expects 1951 to be its best year since the war.

HOLES HOLES

and more HOLES 1500 of them

To be sure, this may be an unusual job. However, it proved the flexibility and practicability of the Bullard Spacer.

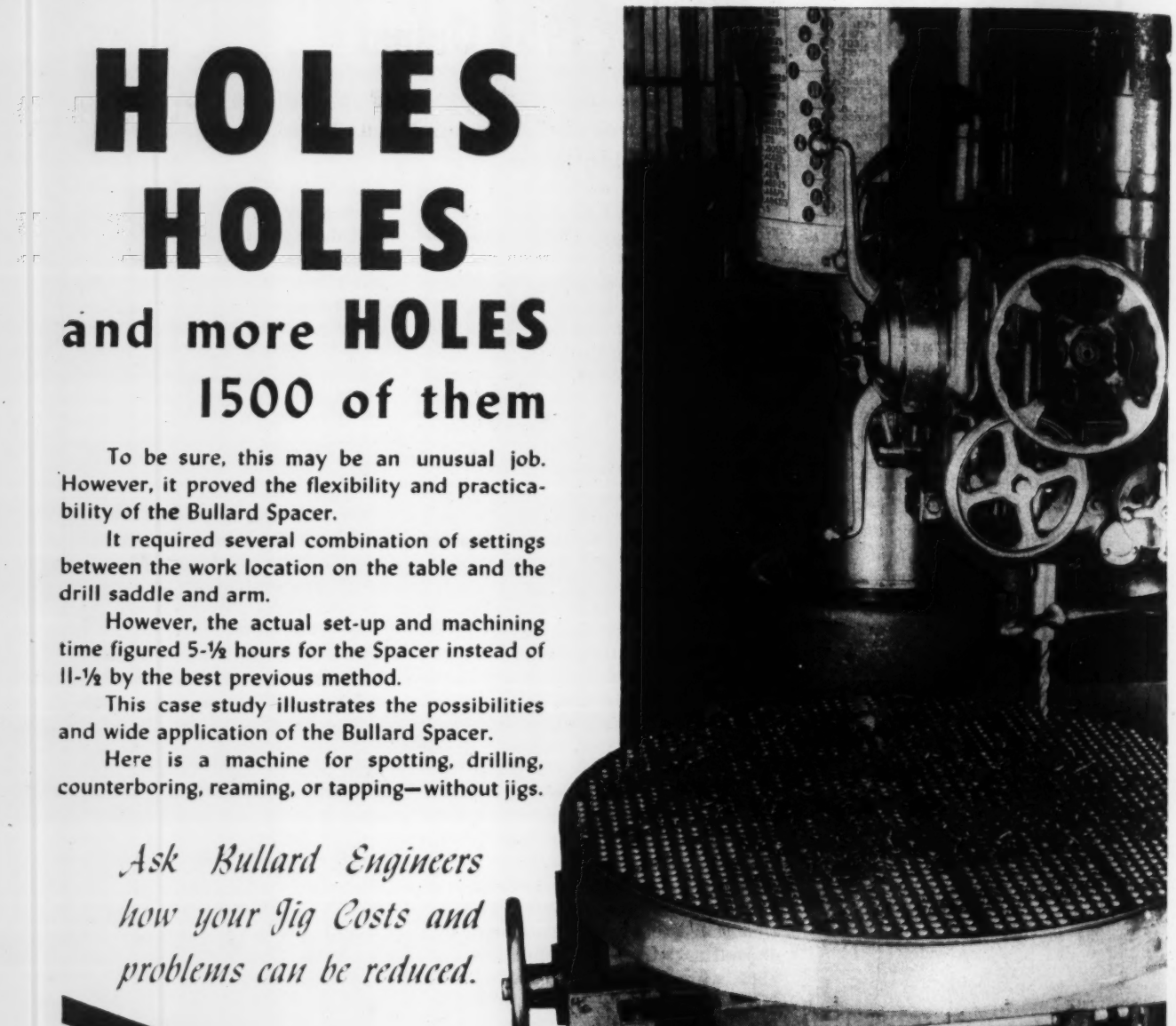
It required several combination of settings between the work location on the table and the drill saddle and arm.

However, the actual set-up and machining time figured 5-½ hours for the Spacer instead of 11-½ by the best previous method.

This case study illustrates the possibilities and wide application of the Bullard Spacer.

Here is a machine for spotting, drilling, counterboring, reaming, or tapping—without jigs.

Ask Bullard Engineers how your Jig Costs and problems can be reduced.



H. C. TUTTLE *Detroit Editor, STEEL*

Mirrors of Motordom

Detroit's enthusiasm is apparently unquenchable. Fish of Chevrolet sees a new plateau of car registrations, but Regulation W may leave automakers high and dry in 1951

DETROIT

A NEWCOMER to this fabulous city is at once impressed with its air of unquenchable optimism. He had expected to encounter considerable crying in the beer over materials shortages, now and apparently to come, and over the sales strangulation induced by credit restrictions in Regulation W. So what happens? The first person he hears discuss the automotive outlook is W. E. Fish, Chevrolet general sales manager, who talks plenty enthusiastically over 1951 model prospects. Then he learns that Chevrolet, Pontiac and Oldsmobile, to name three, sold more cars in the first November sales period than in the preceding October period, when traditionally it's the reverse. Next he finds he can't buy the particular new car he wanted without waiting two or three weeks. Finally he looks around to find only a smattering of snow in the motor city, while much of the Middle West is paralyzed. Man, this is living!

The High Road—Here is the way next year looks to Mr. Fish of Chevrolet: Undoubtedly production will be reduced by NPA's restrictive orders on materials. But the jolt will be common to all other manufacturers, so why be disturbed? Chevrolet dealers have a backlog of 200,000 unfilled orders, average less than four cars and trucks in stock. Credit a big assist to Powerglide automatic transmission. By Feb. 1, capacity for its production again will be doubled and it should be available for all models instead of only about 20 per cent of production hitherto.

As newsmen poked around a 1951 handbuilt model, Fish explained the purpose of Credit Regulation W was to reduce sales, but "as far as our dealers are concerned we can say it has not actually hurt us in our sales to date."

Chevrolet's sales chief thinks a new plateau of registrations has been reached by the auto industry, and Chevrolet has taken the high road to stay on it. Today there are 2.5 million more Chevrolet cars and trucks on that road than in 1941 and its direction is toward a juicy replacement market that makes the future look shiny. Production schedules for the first quarter of 1951 will be on a par with the like period of this year; beyond that there is some fog. But, says Mr. Fish, "By any prewar standard 1951 will be a banner year," (Probably as big as the 3½ x 4-inch display match folders Chevrolet passed around to the press are compared with the conventional book type).

Low Gear? — Some reasons why 1951 will not look so good stacked up against 1950: New truck registrations for this year will top 1,125,000, beating the 1948 high by 90,000. That can't last. Factory sales of new motor vehicles for ten months through October totaled 6,758,418 or 24 per cent ahead of last year's record total for the same interval. Neither can be repeated. Cadillac built its 100,000th job last month after 11 months of production in the current series. That is 23 per cent more than 11 months of the 1949 model and 8 per cent more than the entire 13-month run on the 1949s. Before 1941 Cadillac never turned out more than 50,000 a year. Buick last month made its 500,000th car for the year and, with becoming modesty, Ivan L. Wiles, general manager, says, "We believe production of the 500,000th car will be an annual event from now on."

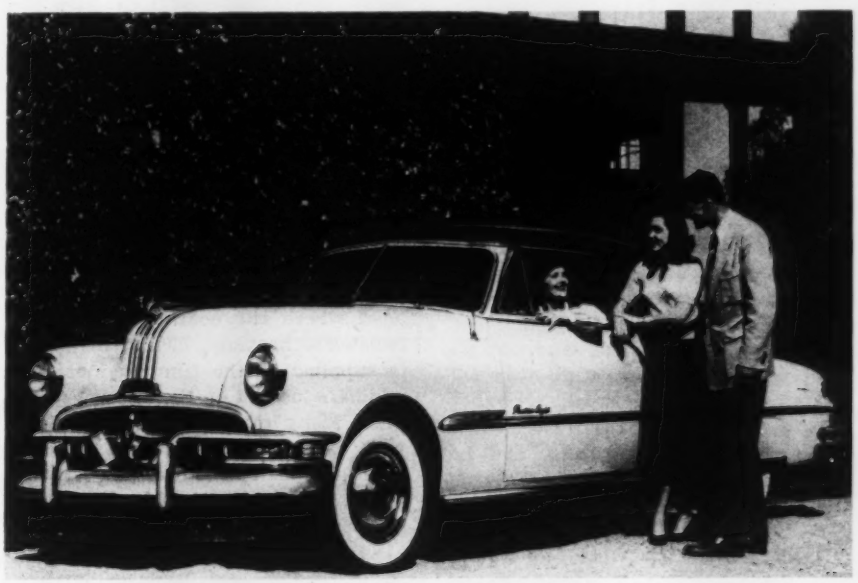
GMC Truck & Coach Division last week pushed truck assemblies past 100,000 for a new peacetime record.

Weather Blitz: The Low Road

When the frivolous elements of winter completely stall all motor vehicles, public and private, as was the case on Thanksgiving weekend in Cleveland, Pittsburgh, Youngstown, Canton, Akron and dozens of other cities in western Pennsylvania, West Virginia and Ohio, the business and industrial economy there just stops. That is graphic testimony to the vital character of the gasoline and diesel engine in these mid-century times. The paralysis is at once exciting and appalling.

Hopeless Inadequacy—Granted the weather blitz was something never experienced in 37 years, still it points up a fact all too often forgotten: The hopeless inadequacy of highway and street construction and maintenance.

That's something Detroit's auto makers might well ponder more intently as they push on to new production records. They might well consider lending on a co-operative basis more technical and financial support to programs for bringing highway development and mainte-



MALIBOU IVORY AND SAPPHIRE BLUE: This is Pontiac's Silver Anniversary 1951 Catalina which is offered in the new two-tone combination, malibou ivory and sapphire blue. Two engines — a six or an eight — and Hydra-Matic or synchro-mesh transmission are offered on all models

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nance—now hardly beyond the requirements of 1935 traffic conditions—up to date.

Tedious Shoveling—For one thing, new types of motorized equipment need to be developed to combat clogged highways and remove mountainous drifts of snow. The picture of hundreds of laborers tediously shoveling perhaps a ton of snow into a truck that will handle 5-ton loads is ridiculous. You can go too far in the direction of motorization, though, as was discovered in Cleveland during the emergency. Confronted by drifts that stalled bulldozers, scrapers and shovel loaders, the city asked the Army for the loan of its fancy "sno-go" unit which scoops up the stuff and blows it 40 feet in the air and back from the highway. That was fine except that on one city street the equipment started blowing heavy chunks of ice through fourth-story windows of apartments.

Frantic Search — Detroiters may have chuckled over their immunity from the blizzard's bite, but the auto follow-up men were frantically trying to find what had happened to their shipments of parts and materials coming from the East. They could have found many of them in the big double rigs and trailer vans foundered along the roads in northern Ohio and within the Cleveland city limits. Many were simply abandoned by the drivers and by midweek were still there.

Old snow-fighting cities like Buffalo and Minneapolis long ago learned there is only one way to keep roads from quickly becoming impassable and that is the fast application of salt and sand mixtures from trucks with automatic spreading attachments that can cover a two-lane highway at a speed of 18-20 mph. If you can keep ahead of the storm with salt-sand, hundreds of thousands of dollars are going to be saved in laborious scraping, shoveling and snow removal. In this connection, an amusing angle was the statement of a Cleveland service department official to the effect salt-sand was no good when the temperature was below 18 degrees. He should see what it does to ice-coated roads even when the mercury drops to zero, and he would not have bothered loading his trucks with ineffective slag and cinders.

Always With Us — There was a little absenteeism around the auto plants in Detroit and Flint last Monday but hard-bitten labor relations officials dismissed it as nothing more than the usual hangovers and not attributable to the mild ice and snow which snarled traffic briefly. Monday and the day after pay-day always see absenteeism mount and there doesn't seem to be much anyone can do about it.

Many drivers in storm areas would have given a lot for windshields equipped with Libbey-Owens-Ford's new "electrapane" glass, the outgrowth of wartime research started nine years ago. The material is clear glass, covered with a microthin transparent metal oxide film, enabling the surface of the glass to conduct electric current and thereby to generate enough heat to melt off ice and snow. As far as is known, no automotive applications have yet been made.

De-Icer—The conductive coating is applied to a job in the form of a lamination, so that the filmed surface is inside the safety glass sandwich. Built-in thermostats or sensing elements control the heat developed where the coating is used for resistance heating. Electrical energy is supplied to the film by means of bus bars located on the surface of the glass along opposite edges, the current path being through the film from one bus bar to the other. Either ac or dc will work. Maximum size of glass sheet is 48 x 60 inches.

Numerous installations of the material in aircraft and ships have proved effective in de-icing. One of the latest applications is in the glazing of cab windows of new commuter trains of the New York Central for service in New York city.

Auto Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	842,304	678,092
September	760,808	657,073
October	804,553*	601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Nov. 4	177,096	116,699
Nov. 11	161,113	114,856
Nov. 18	122,498	115,152
Nov. 25	120,134	76,026
Dec. 2	145,000	72,994

Estimates by Ward's Automotive Reports

* Preliminary.

K-F Wants More RFC Money

Slower sales and higher production have led Kaiser-Frazer to ask the RFC for extension of maximum limits of a revolving inventory loan arranged a year ago from $10 million to $48 million. Although the company may never be forced to draw on the sum to the limit, it wants that much available to finance cars that may not be sold immediately.

K-F thinks it will be switching over some of its capacity to defense production next year; in the meantime floats of components for automobiles are of no value unless they can be worked on through to the final assembly line, even though the immediate sales outlook might not justify such assemblies. Such procedure also will allow the company to hold on to its working force until defense contracts are received. Easing of credit restrictions, of course, could bring some car buyers back to the market, alleviating the need for additional inventory loans.

'Embedability' in Bearing Metals

Engine cleanliness and a successful compromise by bearing designers between strength and softness were the explanations for the rarity of bearing failures in modern engines, said engineer Arvid E. Roach of General Motors Research Laboratories at the annual meeting of the American Society of Mechanical Engineers in New York. Bearing and journal surfaces of an automotive crankshaft may be separated by an oil film only 0.0001-inch thick, so extreme care is taken in manufacturing processes to prevent microscopic dirt, machining chips, grinding particles and core sand from remaining in the engine block before assembly.

If all such abrasive particles could be prevented from reaching the bearings it would not be necessary to strike the balance between strength and softness in bearings. As it is, any particles suspended in the oil which are larger than the minimum oil thickness between journal and bearing threaten satisfactory bearing operation, so a degree of softness, or "embedability" as the engineers call it, must be developed in bearing metals to absorb microscopic abrasive particles.

Soft metal on the bearing surface poses a fatigue problem since the fatigue strength of such a facing decreases with increasing thickness. So the thinking today is that the soft bearing overlay metal with high embedability needs to be only as thick as the largest abrasive particle size.

ARISTOLOY

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Normalized • Straightened • Cold Drawn
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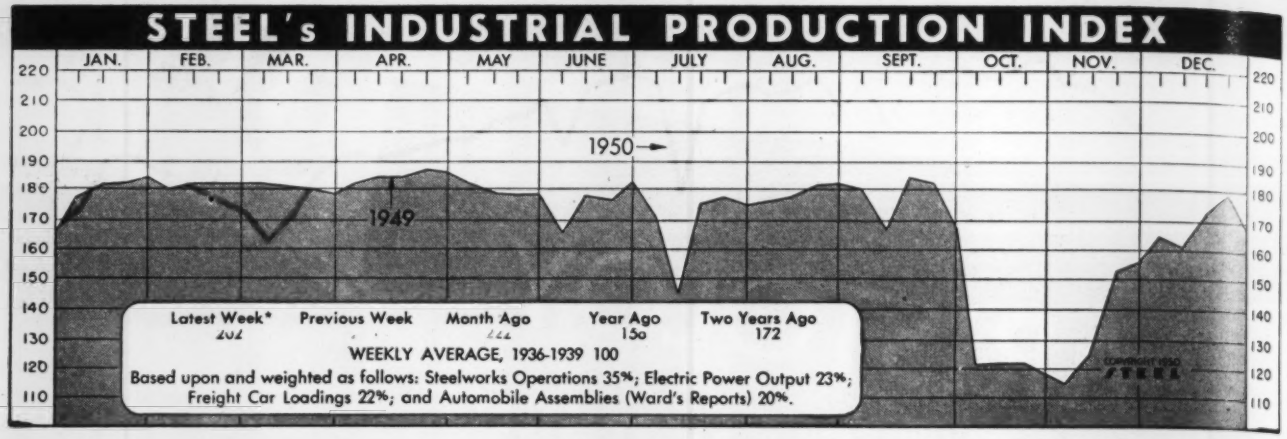
ARISTOLOY STEELS

IT'S BETTER TO USE THE BEST!


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* Previous Week Month Ago Year Ago Two Years Ago
202 172
WEEKLY AVERAGE, 1936-1939 100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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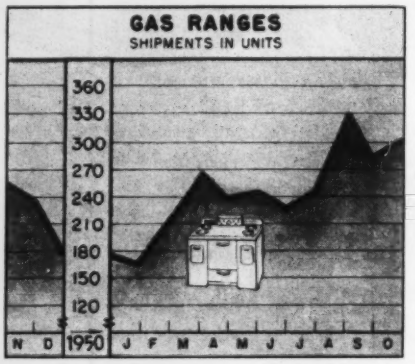
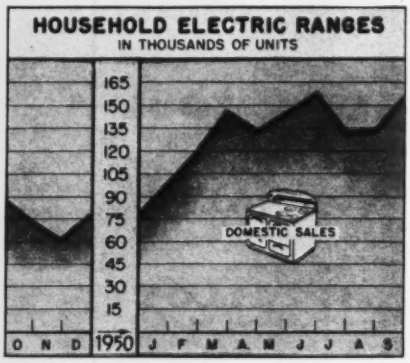
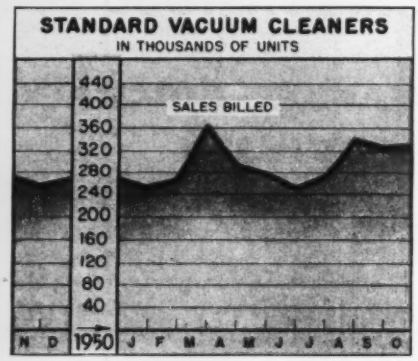
Week ended Nov. 25 (preliminary).







Charts—Copyright 1950, STEEL

Gas Ranges
Shipments in Units

	1950	1949	1948
Jan.	165,000	106,700	222,800
Feb.	209,000	117,700	228,400
Mar.	264,000	151,500	252,100
Apr.	239,100	150,100	245,300
May	242,800	151,600	257,800
June	224,700	162,200	250,500
July	254,800	125,800	203,600
Aug.	331,500	206,100	250,100
Sept.	281,400	227,300	248,500
Oct.	303,800	257,500	257,500
Nov.	.....	237,400	202,300
Dec.	.....	175,700	131,100

Gas Appliance Mfrs. Assoc.

Household Electric Ranges
Sales Billed—Units

	1950	1949	1948
Jan.	97,925	106,473	103,585
Feb.	118,989	87,370	103,506
Mar.	145,417	87,543	127,461
Apr.	132,859	59,894	104,677
May	145,498	52,286	98,983
June	158,534	68,107	123,300
July	130,505	62,402	83,485
Aug.	132,243	66,222	116,107
Sept.	156,216	91,073	128,829
Oct.	.....	72,672	122,516
Nov.	.....	60,523	123,661
Dec.	.....	77,011	105,387
Total	.....	903,806	1,341,497

National Electrical Mfrs. Assoc.

Standard Vacuum Cleaners
Sales Billed—Units

	1950	1949	1948
Jan.	249,150	228,769	304,273
Feb.	263,515	241,267	311,448
Mar.	361,014	309,897	355,415
Apr.	292,664	252,656	306,588
May	278,645	222,850	276,657
June	250,190	207,354	256,071
July	279,967	161,920	229,537
Aug.	341,232	219,909	237,202
Sept.	327,524	250,036	280,084
Oct.	331,445	272,520	281,573
Nov.	.....	253,516	255,080
Dec.	.....	265,513	273,890
Total	.....	2,886,514	3,360,859

Vacuum Cleaner Manufacturers Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Nov.27	Furnaces, W. Air ..Nov.20	Purchasing Power .Oct.2
Durable Goods Nov.27	Gray Iron Oct.30	Radio, TV Aug.14
Employ. Metalwkg. Nov.27	Indus. Produc. Nov.6	Steel Castings Nov.20
Employ., Steel Nov.20	Ironers Nov.13	Steel Forgings Nov.20
Fab. Struc. Steel...Nov.6	Machine Tools Nov.27	Steel Shipments ...Nov.27
Fdry. Equip. Orders.Nov.6	Malleable Iron Oct.30	Wages, Metalwkg. Nov.27
Freight Cars Nov.20	Price Indexes Nov.6	Washers Nov.13
Furnaces, Indus. ...Nov.20	Pump Orders Nov.13	Water Heaters Nov.13

Gas Ranges Near Record

Gas range shipments this year are headed for an alltime industry high. October's shipments were 303,800 units and brought the ten month total to 2,508,400, reports the Gas Appliance Manufacturers Association, New York.

This is a 51.4 per cent increase over the 1,656,500 units shipped in the corresponding period a year ago and exceeds the total of 2,416,600 domestic gas ranges shipped in the same ten months in 1948 when the industry had its biggest production year in history.

Shipments in October reached the second highest monthly total on record and were exceeded only by the 331,500 units shipped in August this year. These two months were the only times shipments have topped 300,000 units in the postwar period.

Electric range shipments also are much higher this year than in 1949. Member companies reporting to the National Electrical Manufacturers Association show sales billed totaling 1,218,186 units in the first nine months.

In the first three quarters last year the same companies shipped 681,370 electric ranges.

More Vacuum Cleaners Sold

Standard-size household vacuum cleaner factory sales in October totaled 331,445 units and represented a small gain over the 327,524 units sold in the preceding month. Vacuum Cleaner Manufacturers' Association says sales in the latest month reported also were 21.6 per cent higher than in the corresponding month a year ago.

Sales for the first ten months in 1950 aggregated 2,975,346 units, compared with 2,367,762 in the corresponding period a year ago. Sales this year are running 25.7 per cent ahead of 1949.

The Business Trend

Excess profits tax legislation wasn't treated kindly in committee sessions but businessmen are still watching developments warily because they know its pitfalls

EXCESS profits tax legislation shaping up in a congressional committee is being watched carefully by businessmen. Insiders believe there is little chance that it will be passed during the lame duck session. Many executives are apprehensive nevertheless. They realize that hardships would result from such a law and relief would be slow in coming for those needing and deserving it. Relief due to companies under previous wartime excess profits tax legislation was rendered in few cases and then after a long delay. Few businessmen are optimistic enough to expect different treatment from the Treasury Department should another excess profits tax be enacted.

Industry last week was too busy trying to shovel its way out of the snow that blanketed midwestern metalworking centers to do much about setting new production records or even getting close to previous marks. In the week ended Nov. 25 STEEL's industrial production index slipped 4 points below the total for the preceding week to a preliminary 202 per cent of the 1936-1939 average. It matched the total for the week ended Sept. 9 as the low point for the index since mid-summer.

Steel Output Blanketed . . .

Nature provided a snow blanket to push the steelmaking rate down from its pinnacle last week. Several steel centers including Pittsburgh, Youngstown and Cleveland were unable to maintain allout operations after a paralyzing snowfall. In the week ended Nov. 25 operations were maintained unchanged at 102.5 per cent of capacity despite the holiday that reduced output in many other industries.

Automotive Decline . . .

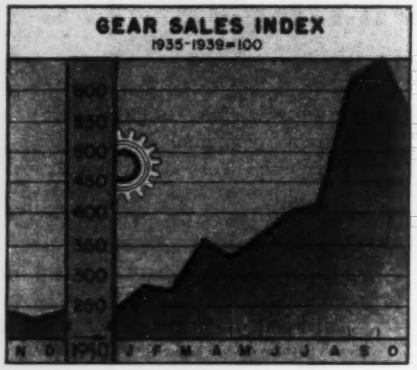
Passenger car output rose in the week ended Nov. 25 but truck output was down because of the holiday so the industry total fell to lowest volume since the first week this year. Outturn consisted of 102,156 passenger cars and 17,978 trucks, compard with 101,793 cars and 24,177 trucks in the preceding week. Two General Motors divisions resumed production during the week and many plants worked Friday and Saturday to account for the higher passenger car outturn. November output in U. S. plants is estimated at 490,000 cars and 101,000 trucks. Operations in coming weeks will be irregular as changeovers by Chrysler and several GM divisions will prevent maximum assemblies until after the first of next year.

Construction Climbs . . .

Heavy construction awards made their third consecutive advance in the week ended Nov. 23 to $235.1 million from $214.9 million in the preceding week. Industrial building, mass housing, public buildings, unclassified construction and highways contributed to the total in the order listed. Private contracts account for $142.9 million and public awards for $92.2 million. The latest week's awards bring the total for the 47 weeks this year to almost $10,667 million, an alltime

BAROMETERS of BUSINESS

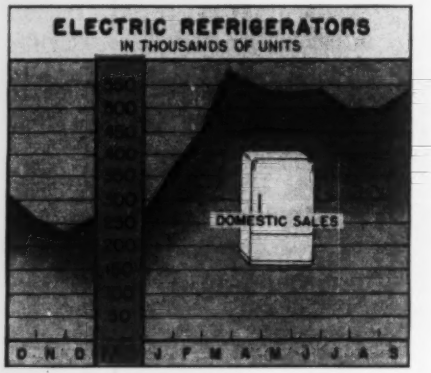
		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	102.5	102.5	102.5	80.0
	Electric Power Distributed (million kilowatt hours)	6,506	6,728	6,562	5,537
	Bituminous Coal Production (daily av.—1000 tons)	1,992	1,833	1,958	2,412
	Petroleum Production (daily av.—1000 bbl)	5,890	5,882	5,895	5,192
	Construction Volume (ENR—Unit $1,000,000)	$235.1	$214.9	$245.1	$90.2
	Automobile and Truck Output (Ward's—number units)	120,134	125,970	188,200	115,152
	*Dates on request. †1950 weekly capacity is 1,928,721 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	790†	837	888	665
	Business Failures (Dun & Bradstreet, number)	146	170	160	148
	Money in Circulation (in millions of dollars)‡	$27,450	$27,296	$27,121	$27,508
	Department Store Sales (changes from like wk. a yr. ago)‡	+7%	+7%	+3%	−8%
	†Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$17,263	$16,319	$16,118	$14,492
	Federal Gross Debt (billions)	$257.0	$256.9	$256.9	$256.9
	Bond Volume, NYSE (millions)	$20.7	$25.1	$19.3	$14.9
	Stocks Sales, NYSE (thousands of shares)	10,408	9,871	11,018	5,706
	Loans and Investments (billions)†	$69.4	$69.4	$68.8	$66.5
	United States Gov't. Obligations Held (millions)†	$33,349	$33,392	$33,580	$37,257
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	157.76	157.76	157.68	152.52
	STEEL's Nonferrous Metal Price Index‡	240.5	239.5	234.9	164.3
	All Commodities†	171.2	171.0	168.9	151.5
	Metals and Metal Products†	180.4	180.1	178.1	169.2
	†Bureau of Labor Statistics Index. 1926=100 ‡1936-1939=100. ††1935-1939=100.				



Gear Sales Index
1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	358.4	299.1	389.8
April	328.6	339.0	320.9
May	363.1	250.1	283.6
June	401.0	227.8	324.1
July	410.7	193.1	384.4
August	617.4	262.0	335.6
September	654.5	224.9	320.4
October	564.8	242.3	333.3
November	....	230.7	309.0
December	....	242.8	325.9

American Gear Mfrs. Assoc.



Electric Refrigerators
Domestic Sales—Units

	1950	1949	1948
Jan.	364,002	380,853	272,121
Feb.	450,751	337,424	281,580
Mar.	572,691	369,216	338,109
Apr.	531,498	324,370	330,720
May	528,506	330,753	317,763
June	534,489	296,199	373,115
July	490,802	315,444	351,094
Aug.	496,486	307,622	281,345
Sept.	512,125	309,429	344,260
Oct.	.....	252,580	380,854
Nov.	.....	221,221	374,470
Dec.	.....	259,158	330,660

National Electrical Mfrs. Assoc.

Charts—Copyright, 1950, STEEL

record and 46 per cent more than the volume for the corresponding period a year ago. Private construction is the pacesetter as it totals $6194 million and tops last year by 78 per cent. Public works totals more than $4472 million and is 17 per cent above a year ago. Industrial building shot up to $53.9 million in the latest week and pushed the 47-week total to $1484 million, an alltime record and a 68 per cent increase over the corresponding period in 1949.

Power Needs Up . . .

Increased industrial and domestic electric energy requirements resulted in a large jump in electric energy distribution during the week ended Nov. 18. That week 6728 million kwhr were distributed by the electric light and power industry and wiped out the week old record of 6574 million kwhr.

Larger R.R. Revenues . . .

Association of American Railroads estimates that railroad operating revenues in October were 36.7 per cent higher than in the same month a year ago. The estimate covers only operating revenues and does not take into account operating expenses or other costs. Revenues in October, 1949, were down considerably because of the coal and steel strikes while this year operations were maintained at high levels. Freight revenues were 41.3 per cent higher in October than they were a year earlier. The largest percentage gain occurred in the eastern region where revenues were up 53.7 per cent. This region was hardest hit by strikes in 1949.

Trucking Gains Continue . . .

Volume of freight transported by motor carriers in September was 20.5 per cent higher than in the same month a year ago but 9.3 per cent below the August total. Reports received by the American Trucking Associations from 262 carriers in 41 states show these carriers transported 4,039,690 tons in September, compared with 4,455,215 tons in August and 3,353,383 tons in September, 1949. Carriers of iron and steel hauled about 6 per cent of total tonnage. Their volume decreased 6.9 per cent below August but increased 31 per cent above September, 1949.

Gain in Coal . . .

Bituminous coal output rose 950,000 tons in the week ended Nov. 18 to 11,950,000 tons. Cumulative output for this year to the date reported is 444.6 million tons. A year ago it was 378.2 million tons.

Financing Expansion

Retained profits made possible bulk of postwar improvements; dividends low

FINANCIAL SACRIFICE by holders of stock in American industry has to a great degree made possible the postwar expansion of industry and business in this country.

Instead of distributing most of its profits in the form of dividends to stockholders, industry has heavily retained its profits and plowed the great bulk of them into expansion, a study by the National Association of Manufacturers shows.

Reflecting the step-up dollarwise in the retaining of earnings, United States corporations withheld $1.7 billion in 1946, $4.6 billion in 1947, $9.5 billion in 1948, and $9.6 billion in 1949.

Holdout — The retained profit in 1946 was equivalent to approximately 1 per cent of the national income; in 1947, almost 2.5 per cent; in 1948, approximately 4.5 per cent; and in 1949, 4.5 per cent. Meanwhile, dividends remained almost stationary at between 3.5 and 4 per cent of the national income. This level is distinctly below that of the prewar years; then it ranged from around 4.5 per cent to around 7 per cent of national income, even during the depression years.

"This low level of postwar corporate dividends," says NAM, "settles the question of whether stockholders or customers are paying the cost of capital expansion. Clearly it is the sacrifice of the stockholder—in receiving abnormally low dividends—that is responsible for the funds available as undistributed profits."

Far-Reaching Effects — "The low level of postwar corporate dividends has a significance which goes far beyond the question of who pays for corporate expansion. "It," says NAM, "is one of the most profound facts bearing on postwar financial practices. Low dividends mean that funds can be retained for current capital needs. The level of dividends is also reflected in the level of stock prices, and this in turn influences the ability of corporations to raise capital through sales of new stock issues."

Over the four-year period, 1946-1949, retainment of earnings was the most important source of funds for U. S. corporations. Through this means they got $25.4 billion. Depreciation and depletion provided $24 billion.

The new issues of stock provid-

ed only $5.1 billion. While debt financing, such as bank loans, bond issues and credit extended by suppliers, was a big factor in 1946, 1947 and 1948 and provided $27.6 billion it lost its importance in 1949 when corporations began paying off such debts rather than incurring new ones.

Stockholders' Sacrifice—The $25.4 billion derived from retained earnings is nearly equal to the $27.6 billion spent by U. S. corporations in the period of 1946-1949 for expansion.

The replacement of plant and equipment consumed by operations during that period amounted to $32.3 billion, making the total spent for expansion and replacement $59.9 billion.

The NAM study points out that the $9.2 billion raised annually in 1946, 1947 and 1948 by borrowing approximately matched the $8.6 billion devoted annually in those years to inventory accumulation and to providing credit to customers. "If these requirements had not existed," NAM says, "all of the $14.6 billion needed for plant and equipment in 1946, 1947 and 1948 would have been available without borrowing, for retained profits, depreciation and depletion, stock issues, and other miscellaneous sources together came to $15.1 billion annually.

"Thus corporate borrowing during the early postwar years," NAM observes, "was necessitated by the temporary need for expanding inventories and receivables, as business returned to peacetime. When those temporary needs disappeared in 1949 the corresponding necessity for borrowing also disappeared."

Utilities Fight Higher Taxes

Exemption from higher federal defense taxes is sought by public utilities. They assert that regulations under which they must operate prevent excess profits, and that therefore they are in no position to take on an additional tax burden.

In fact, higher taxes on the utilities would impede them in keeping strong and making vital contributions to the defense program, says Harold Quinton, executive vice president, Southern California Edison Co., in speaking for regulated private electric companies at a hearing of the House Ways & Means Committee in Washington.

"Our federal taxes on income," Mr. Quinton points out, "are 7.5 per cent of our total sales, as compared with federal income taxes of 3⅛ per cent of total sales for all industry. We are, and have been for a long time, contributing a relatively greater portion to the increased cost of defense, and to all other federal governmental costs, than other industries."

Mr. Quinton stresses that "there would be no inflation in this country today if all other industries and labor had maintained the price levels that we have maintained." This statement was documented with figures which showed that the index of electric and gas rates have been held to 97 per cent of 1935-1939 levels, while costs of living and other indexes have climbed to 165 to 246.

"We have not increased our profits during 1946-1949," he emphasizes. "We have actually experienced a decline. Our electric industry reported a total of $887 million in earnings in 1945, on a capital investment of $13,545,000,000, or a return of 6.55 per cent. At the end of 1949 we had combined earnings of $1,021,750,000, but a total average investment of $16,550,000,000 and our return had declined to 6.17 per cent.

"I know of no unregulated industry that can point to such a record," Mr. Quinton remarks.

Good Business Seen Into 1951

Industrial business will be good through the first quarter of 1951 if it is not hampered by further government restrictions on the use of critical materials.

That's the consensus of the National Association of Purchasing Agents.

While new orders received by industry continued to decline in November there still are sufficient orders on the books to assure good business through 1951's first quarter.

With production holding at high rates and still increasing where materials and manpower are available the gap between increasing production and decreasing orders is widening, the association points out. November marked the third consecutive month of the widening of the production-ordering gap.

The decreasing order trend may represent a decline in scare-selling or the increasing grip of controls, the association says. Military business is creeping up but is spotty overall.

Seventy-one per cent of the purchasing agents are buying for 90 days ahead, and 29 per cent are ordering for four months and beyond.

Inventories are drifting downward but at a reduced pace. Many inventories, the association's survey shows, are now below practical needs for steady operations; there is a growing imbalance in raw material stocks, which is spreading into work-in-process. Government restrictions, coupled with government stockpiling and ECA commitments, forecast further confusion.

NEA

GRAPHIC DEMONSTRATION: Dr. Allen B. DuMont, president of the laboratories of the same name displays the 7-foot wheel that would be required to receive the CBS-authorized color signals on the new 30-inch screen perfected by the company's laboratories. The demonstration was made at the fourth annual Men of Science & Industry dinner at New York's Waldorf-Astoria. The giant wheel was displayed to show the impracticability of the color system approved by the Federal Communications Commission. Without color wheels, Dr. DuMont says, none of the country's 8 million receivers would be able to pick up color signals transmitted by the CBS system. With Dr. DuMont is Dr. Thomas T. Goldsmith (right)

Men of Industry

Harry G. Morrow was appointed vice president of **L. B. Foster Co.**, Pittsburgh, supplier of railroad trackage, steel sheet piling and pipe. He was formerly sales manager for welded products for Spang-Chalfant Division, National Supply Co., with which he had been associated since 1939.

George C. Peters was promoted to the newly created position of safety engineer in the office of the supervisor of safety and welfare, **Jones & Laughlin Steel Corp.**, Pittsburgh. He formerly was assistant superintendent of safety and welfare at the Aliquippa Works.

J. L. Newdoerfer, formerly executive vice president, **Wheeling Steel Corp.**, Wheeling, W. Va., was elected president to succeed the late **Arch L. McFarland.**

George H. Zimmerman was named consultant to **Dearborn Motors Credit Corp.,** subsidiary, Dearborn Motors Corp., Birmingham, Mich. The subsidiary company finances wholesale and retail purchases of Ford tractors and Dearborn farm equipment.

Clifford V. Coons, vice president in charge of sales, **Rheem Mfg. Co.,** New York, was elected a director of the company. He fills a new position on the Rheem board, created by an increase in the number of directors from seven to eight.

H. W. Vogenberger Jr. was appointed assistant general superintendent, **Lake Terminal Railroad Co.,** Lorain, O.

L. E. Creighton has retired as chairman, **Rotary Electric Steel Co.,** Detroit, but continues a director and consultant. **J. A. W. Inglehart,** partner in the investing banking firm of W. E. Hutton & Co., succeeds Mr. Creighton as chairman. **J. A. Shimmin,** formerly chief engineer, was named assistant general superintendent of Rotary, and **C. Melvin Smith,** formerly with Freyn Engineering Co., is Rotary's chief engineer.

E. D. Peck, general paint manager, **Pittsburgh Plate Glass Co.,** Pittsburgh, was appointed general manager of the firm's brush division. **James H. Heroy Jr.** was appointed assistant general manager of the brush division, with headquarters in New York. Mr. Peck will have headquarters in the Pittsburgh office.

LAWRENCE M. RICH
. . . directs Proto and subsidiary sales

ROBERT A. BODE
. . . Hartford Special Machinery-sales

Lawrence M. Rich was appointed vice president and general sales manager, **Plomb Tool Co.,** Los Angeles. In his new capacity he directs all sales and related activities for Proto tools, and also supervises sales operations of the company's subsidiaries. Mr. Rich joined the company in 1929 and was eastern sales representative until 1932. He then served the Marlin-Rockwell Corp. for eight years as New York branch manager. He was in the U. S. Army for six years during World War II. From 1946 to 1950 he was director of sales, Durkee-Atwood Co., Minneapolis.

Shippers' Car Line Corp., subsidiary, American Car & Foundry Co., New York, elected **Harry J. Leddy** executive vice president. **John B. Davenport** was elected vice president in charge of sales. Mr. Leddy served 33 years in the field of tank car operations and Mr. Davenport 30 years in tank car sales, with both ACF and Shippers.

George W. Ingham was appointed assistant to the works manager of the Minneapolis plant of **United States Air Conditioning Corp.,** to assist works manager, H. J. Schorle. Mr. Ingham formerly was general superintendent in charge of air conditioning at the Worthington Pump & Machinery plant in Holyoke, Mass.

Elmer Gammeter was named director of laboratories for **Globe Steel Tubes Co.,** Milwaukee. He has been chief metallurgist since 1943. He succeeds **Dr. H. K. Ihrig,** resigned to become research head for Allis-Chalmers Mfg. Co.

Hartford Special Machinery Co., Hartford, Conn., appointed **Robert A. Bode** as sales manager, and **J. James Tasillo** as assistant sales manager for its complete line of automatic drilling and tapping machines, die polishing machines and other products.

Harry L. Brodbeck was appointed director of car distribution for **Buick Motor Division,** Flint, Mich., General Motors Corp. He succeeds the late **Lester M. Taylor.** Since 1940 Mr. Brodbeck has been assistant to Mr. Taylor. He joined Buick in 1928.

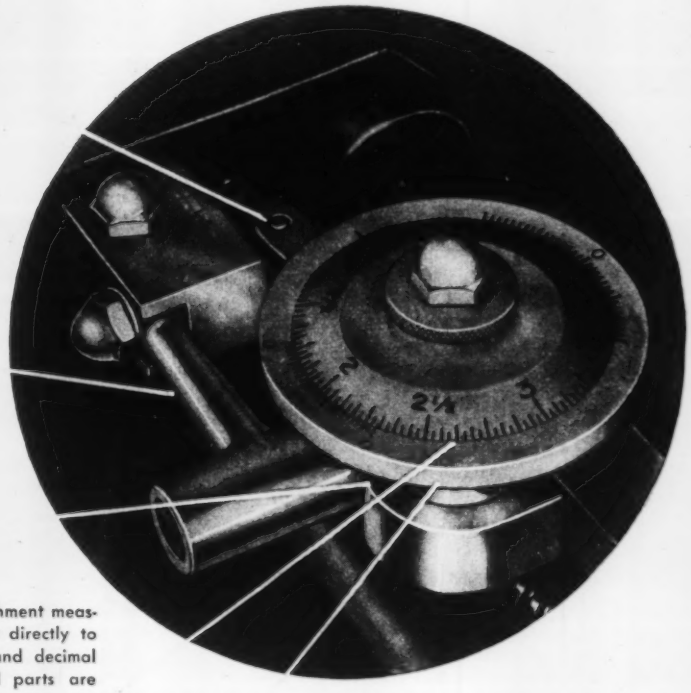
F. L. McClure was appointed director of fleet sales for **Kaiser-Frazer Corp.,** Willow Run, Mich. With K-F since July as fleet sales manager in the St. Louis region, Mr. McClure has a background of 30 years in the auto sales field. He joined the Chevrolet's commercial truck and fleet sales department in 1931 and later became assistant manager for western states.

Harbison-Walker Refractories Co., Pittsburgh, appointed **Carl G. Holmes** to its Pittsburgh district sales staff. He has had 18 years of experience in the sale of insulating and refractory products.

Kenneth L. Horgan and **Vernon L. Ingersoll** were appointed to head newly formed sections of the eastern district sales organization of **Westinghouse Electric Corp.,** Pittsburgh. Mr. Horgan was named supervisor of the petroleum, chemical and communication section of the industrial division, and Mr. Ingersoll was appointed to a similar post in charge of the mining, paper and textile section. Both men

FORGINGS vs. CASTINGS?

Sorry, it wasn't even a contest!



The Weldon Lathe Attachment measures carriage movement directly to .001". Both fractional and decimal dials are available. All parts are chromium plated.

Anaconda Die Pressed Forgings illustrated are full-size and unretouched. On the spindle housing, right, machining costs were reduced 70%; on the dial, next above, 40%.

In the first place, they shouldn't be in the same ring together, because Anaconda Die Pressed Brass Forgings have almost twice the strength of ordinary brass sand castings.

The Weldon Tool Co. of Cleveland, makers of the Weldon Direct Reading Measuring Attachment for lathes, switched from sand castings to forgings and found the extra strength a big sales advantage.

They also found a lot of other things: Solid, dense-grained, readily machinable metal; die-like dimensional accuracy; a surface smoothness that cut finishing and plating costs to the bone. And . . . an overall saving of 30%!

Publication B-9 will get you off to a good start. Write for it now. Address The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: New Toronto, Ontario.

You can depend on twice-wrought

DIE PRESSED FORGINGS

will report to **J. S. Parry,** industrial division manager of the eastern district. **Dr. Daniel Alpert** was named manager of the physics department of the Westinghouse research laboratories to succeed the late **Dr. R. C. Mason.**

Adalet Mfg. Co., Cleveland, appointed **Walter W. Wildeman,** Atlanta, to cover its southeastern territory, comprised of North and South Carolina, Tennessee, Georgia, Alabama and Florida. In the Southwest the **H. R. Onarecker & Co.,** Houston, will represent the company in Oklahoma, Arkansas, Texas, Louisiana and Mississippi.

John W. Reavis, member of the law firm of Jones, Day, Cockley and Reavis, Cleveland, and a director of **Jones & Laughlin Steel Corp.,** Pittsburgh, was elected a member of the latter's executive committee.

Burch H. Falkner was promoted from assistant branch manager to branch manager of **Southern States Iron Roofing Co.'s** Birmingham plant. **H. O. Nash,** who headed the entire plant for several years, will direct manufacturing operations.

James J. Filas was appointed manager of the newly created fastener department, **Acme Steel Co.,** Chicago. He was special representative in charge of stitching machine activities in the central division.

Maj. Gen. Clinton F. Robinson and **Duncan C. Menzies** were elected directors of **Fansteel Metallurgical Corp.,** N. Chicago, Ill., to fill vacancies created by resignations of **James M. Troxel** and **Robert H. Harrison.** Mr. Robinson is president, Frederic R. Harris Inc., consulting engineer, New York. Mr. Menzies is executive vice president and general manager, Ball Bros. Co., Muncie, Ind.

Robert A. Harris was appointed chief improvement engineer, production department, **American Car & Foundry Co.,** New York. He joined ACF in 1938. He was assistant improvement engineer.

J. K. Adams, Houston, was appointed manager of **Texas Eastern Production Corp.'s** land and lease department. Texas Eastern Production is the exploration and producing subsidiary of Texas Eastern Transmission Corp. at Shreveport, La. Mr. Adams was formerly with Mills Bennett Production Co., Houston, and other Mills Bennett organizations. He engaged in pipe line, production, and land and lease operations for these companies from 1929 to 1950, and had previous association with Timken Roller Bearing Co.

C. A. Hubley was appointed manager of the Michigan sales division, **Cleveland Industrial Tool Co.,** Cleveland. The division was recently opened at 10526 Grand River Ave., Detroit. **Ken C. Boalen** was appointed field engineer. For the last six years both Mr. Hubley and Mr. Boalen have been working in the Detroit territory for the Cleveland office of Cleveland Industrial Tool Co., manufacturer of Citco solid copper diamond tools, and Citco hydraulic diamond turners.

A. C. Daugherty was appointed manager of market research for **Rockwell Mfg. Co.,** Pittsburgh, effective Jan. 1. He joined the company as a student engineer upon graduation from Penn

A. C. DAUGHERTY
. . . mgr. of market research, Rockwell Mfg.

State. In 1947 he became a market analyst in the company's market research department. Mr. Daugherty succeeds **W. A. Marsteller,** who is resigning the first of the year to establish the Marsteller Co., marketing and advertising consultant, Chicago.

Lt. Cmdr. H. C. Salzer, USNR, has been recalled by the Navy Department to active duty as officer-in-charge, raw materials section, Bureau of Ships, Navy Department, Washington. Prior to World War II he was with Jones & Laughlin Steel Corp. in Cleveland, and since 1947 has been associated with **Jos. T. Ryerson & Son Inc.,** in San Francisco.

C. Spence Purnell was appointed eastern district manager of the newly formed agency and construction division of **Westinghouse Electric Corp.,** Pittsburgh. The new division, formed by amalgamation of the previous agency and specialty division and the construction section of the industrial division, will handle sales of Westinghouse products through agent, industrial, and wholesale distributors as well as caring for needs of the construction industry. Appointed manager of the new sales department is **Harold L. Cramer.**

Horizons Inc., Princeton, N. J., appointed **Robert G. McAllen** assistant to the president.

Dwight A. Johnston, since 1946 an agent specializing in air, hydraulic and mechanical equipment for power control and transmission, was named by **American Flexible Coupling Co.,** Erie, Pa., to handle "Amerigear" and "American" shaft couplings in the Youngstown district.

William J. Healey was appointed manager, New York district office, **Weston Electrical Instrument Corp.**

Kenneth T. Gordon was appointed purchasing agent, **Okonite Co.,** Passaic, N. J., manufacturer of insulated wires and cables. He also will direct purchases for the company's Hazard Insulated Wire Works Division, Wilkes-Barre, Pa., and for Okonite-Callender Cable Co., Paterson, N. J. **John L. Fabiny,** previously in charge of metals and chemicals purchases, was named assistant purchasing agent.

Continental Foundry & Machine Co., Pittsburgh, appointed **John G. McLain** to its roll sales engineering staff. He will be located at the East Chicago, Ind., plant. He previously was in a roll sales position with Lewis Foundry & Machine Co.

Inland Steel Co., Chicago, appointed **Henry N. Schumacher** superintendent of its cold strip mill, and **William J. Walsh** as superintendent of its tin plate department. These two departments of the company's Indiana Harbor works previously operated as a unit under the supervision of **Alfred J. Castle** who was transferred to inactive status under the company's retirement plan along with **Harry C. Barnes,** cold strip superintendent, and **Stuart A. Koegle,** tin plate superintendent. **John A. Keckich** was transferred from the labor relations department to the cold strip mill as assistant superintendent.

Hodge C. Morton was named director of sales for **Automatic Washer Co.,** Newton, Iowa. He has spent almost

20 years in the household appliance and home laundry fields, most recently as head of the contract sales division of Murray Corp. of America. Earlier he was a regional manager, Maytag Co., and assistant sales manager, home laundry appliance department, Frigidaire Division, GM.

John G. Hall, vice president of **Duro-Chrome of Chicago Inc.,** Chicago, a division of Vacuum Can Co., was elected president. Mr. Hall, pioneer in development of electro-chrome plating, has been with Duro-Chrome since its formation in 1933.

George A. Wampler, former sales representative in the Memphis, Tenn., district office of **Allis-Chalmers Mfg. Co.,** was named manager of the Chicago warehouse sales unit, a new section set up in the company's Chicago district office to handle sales of small apparatus including motors, controls, Texrope drives and pumps. The new unit will be located at 500 E. 27th St.

Price M. Davis Jr. was appointed factory representative for Michigan, eastern North Dakota including Bismark, and eastern South Dakota including Pierre by **Hose Accessories Co.,** Philadelphia. He also continues to cover Minnesota, Wisconsin, northern Illinois and northern Indiana.

John Williamson became materials control supervisor for **Hunt-Spiller Mfg. Corp.,** Boston, to succeed **John E. Henry,** resigned.

W. E. Phillips, president, Canadian Pittsburgh Industries Ltd. and Duplate Canada Ltd., subsidiaries, **Pittsburgh Plate Glass Co.,** Pittsburgh, was elected a director of the parent company to succeed the late **James H. Heroy.**

VINCENT W. SUELLAU
... General Chemical sales director

MILTON G. PECK
... sales mgr., Clark hand trucks

Vincent W. Suellau was appointed director of sales, general chemical division, **Allied Chemical & Dye Corp.,** New York. A member of the general chemical sales organization for 30 years, Mr. Suellau has been a heavy chemical sales manager since 1944. He succeeds **Chester M. Brown,** appointed a vice president.

Raymond J. Kunkel was appointed to fill the unexpired term of his father, the late **Frank H. Kunkel,** as a member of the board of Globe-Wernicke Co., Cincinnati. **Robert E. Nelson** was elected chairman of the executive committee.

Bell & Gossett Co., appointed **George F. Gilfin** exclusive agent for its products in Mexico.

Corbin H. Myers was appointed superintendent of industrial engineering, **National Supply Co.,** Torrance, Calif. **David M. Sowle** is superintendent of industrial relations.

Milton G. Peck was appointed sales manager for the recently introduced line of **Clark Equipment Co.'s** powered hand trucks. He formerly was with Yale & Towne Mfg. Co.

Lockheed Aircraft Corp., Burbank, Calif., appointed **D. O. Woods** works superintendent. **William Shulver Jr.** was appointed traffic manager.

Acheson Colloids Corp., Port Huron, Mich., appointed **Frank M. Hall** as plant superintendent succeeding **Alfred E. Emms** who retired last month. Mr. Hall was first employed by the Acheson corporation in 1919 on production work. He became assistant plant superintendent in 1942.

Reliable Spring & Wire Forms Co., Cleveland, appointed **C. E. Etzler** as district sales engineer for eastern Pennsylvania. He has had considerable experience as a sales engineer in precision metal components.

OBITUARIES...

Arch L. McFarland, 67, president of **Wheeling Steel Corp.,** Wheeling, W. Va., for ten years, died Nov. 28.

Bennet Bronson, 62, vice president, **Scovill Mfg. Co.,** Waterbury, Conn., died Nov. 24. He was associated with the Scovill company and the Oakville Division of Scovill for many years.

A. H. Woodward, 74, chairman of the board of **Woodward Iron Co.,** Birmingham, and vice chairman of the board of the **Wheeling Steel Corp.,** Wheeling, W. Va., died Nov. 23.

G. W. Burnham, 80, longtime executive in the brass industry until his retirement in 1923, died Nov. 22. He was connected with **American Brass Co.,** Waterbury, Conn., where in 1905 he was made a secretary, and served as its executive vice president from 1920 to 1923.

Frank T. McQuillin, 58, vice president in charge of production, **Standard Buffalo Foundry Inc.,** Buffalo, died Nov. 19 after a long illness.

John M. Hunt, 49, president, **Robertson Truckaway Co.,** Los Angeles, died Nov. 15.

Albert W. Morse, 64, a consulting engineer and president of **Anthony Co.,** Long Island City, N. Y., died Nov. 25.

W. J. Chapin, 51, sales manager, **Ladish Drop Forge Co.,** Milwaukee, died Nov. 26.

Evan B. Janson, 59, a development engineer for **Thompson Products Inc.,** Cleveland, died Nov. 26.

John C. Walter, 67, president, **Alvey-Ferguson Co.,** Cincinnati, manufacturer of conveying machinery, died Nov. 18. He joined the company as sales engineer in 1912.

Oliver E. Landroth, 50, projects engineer of the heavy construction firm of **M. W. Kellogg Co.,** New York, died Nov. 19 at Glen Ridge, N. J.

Joseph W. Wacker, 70, president, **Sterling Tool & Mfg. Co.,** Milwaukee, and treasurer of K-W Products Corp., died Nov. 27.

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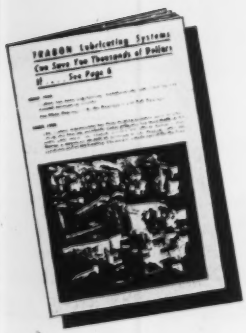

Backed by 20 years of experience in engineering and installing lubricating equipment, Trabon can save you thousands of dollars. Write for this booklet which shows how it can be done.

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Production AND Engineering NEWS AT A GLANCE

HORIZONTAL INGOT CASTING—Developed in Belgium, a system for continuous casting of steel ingots in multiple molds will merit the attention of engineers in this country who have been active in furthering this method of ingot casting. Although now in nothing more than the blueprint stage, the idea has apparent advantages: Molds are connected with the ladle without interruption of the continuity; pressure of the ladle metal results in the skin of ingots being in contact with the mold wall over a large surface, and risks of cracking or breaking the skin are reduced; no cutting of ingots is required in the course of the operation; oxidation of the steel is minimized by the closed-circuit arrangement. Belgian J. F. Jacquet (p. 108) outlines a six-ingot setup.

MATURITY NOT YET SIGHTED—In spite of all the electronic schemes in use, the fact remains that electronic apparatus is still not mature, according to D. D. Knowles, manager of Westinghouse's electronic engineering department. He says in the *Westinghouse Engineer* that this branch of engineering is not yet reliable as it should be. For electronics to attain its rightful place in the sun, he points out, it requires: Best efforts of the tube designer and manufacturer to make better tubes, and the equipment designer and manufacturer to make better equipment. Also an educational program is needed to teach the user how to maintain and use such electronic equipment and tubes in his plant.

CAST ON THE BUTTON—If you have ever looked at the maze of cored passages, slots, holes and recesses in the valve body of an automatic transmission, which is the heart of the entire mechanism, you would agree that it is a designer's nightmare and one of the most complicated casting jobs ever attempted. Most are made to precision tolerances by die casting aluminum (p. 96); one successfully does the job in cast iron.

NO JOB FOR FINGERNAILS—Testing surface roughness by running a fingernail over surfaces and comparing "feel" gets you in plenty of hot water. Physicists Research Co., Ann Arbor, Mich., says that to reach the bottom of most roughness irregularities a tracer point of not more than 0.0005-inch tip radius is required. A fingernail tip is dozens of times as blunt as the mentioned tracer point. It cannot reach the bottom of most roughness irregularities. Instead it will bridge or straddle them. Also, the fingernail is relatively soft. This makes it subject to sudden and unknown changes in "tip radius" which further complicates judging roughness.

TURNING WHEELS—At the rate the fast freights are rolling, railroads eagerly grab at any improvement in maintenance practice to keep 'em highballing. In the Southern Pacific shops at Los Angeles, a beefed-up 52-inch lathe with carbide tools and running at speeds up to 24 rpm instead of the former 2 rpm brought a 50 per cent reduction (p. 99) in the time required to re-turn car wheels.

FAST CYLINDER BORING—A new special machine for drilling and boring aircraft cylinder heads, developed by Cross Co., Detroit, enables one operator to complete 80 pieces per hour at 100 per cent efficiency. Work is completed at four cutting stations although an additional station is provided to facilitate loading. The unit drills valve guide holes and rough forms valve pockets and spring compartments. In a second operation, it finish bores the valve guide holes, insert and spring seats. Stub tools are used for drilling and forming.

CHROMIUM AT LOWER COST—As a part of its program for the economic utilization of substandard chrome ores, the Bureau of Mines has worked out details (p. 92) of an improved process for electrolytic production of high-purity chromium metal. Success of a pilot plant in Boulder City., Nev., operated by the bureau, has culminated in plans for a full-scale operation at Sault Ste. Marie., Mich., to be built and operated by Union Carbide, with operations scheduled next spring.

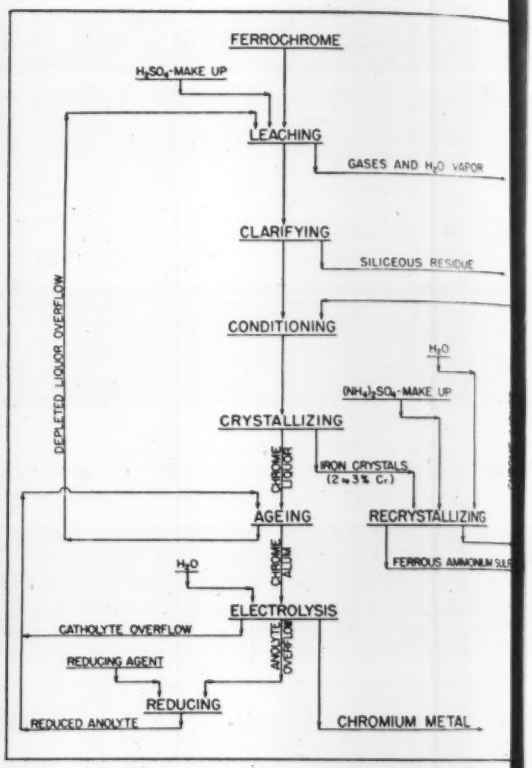
EXTENDS CONVEYOR BELT LIFE—Properly compounded cold rubber for conveyor and elevator belt use should add 10 to 25 per cent more wear in certain services, B. F. Goodrich Co. technicians report. The man-made rubber gets its "cold" designation because it is made at a temperature of 41° F while general purpose rubber is created at a temperature of 122° F. The rubber is being produced in large amounts in government rubber plants, including one at Port Neches, Texas, operated by Goodrich.

"FLASH EVAPORATION"—If you are processing highly polished water wetted metals, and would like to avoid staining, you might examine a new vapor method of drying which is being successfully used in the manufacture of name plates and miscellaneous plated castings. Primary objective of any vapor drying system is to heat the metal as quickly as possible to achieve "flash evaporation". The new technique reported by W. Sparks, DuPont's Boston representative, speeds the process through use of perchlorethylene. Parts are passed directly from rinse to dryer; then immersed slowly in perchlorethylene and held for 30 to 120 seconds, depending on amount of water holdup. Work is then withdrawn from the dip gradually, and passed through the vapor phase for drying.

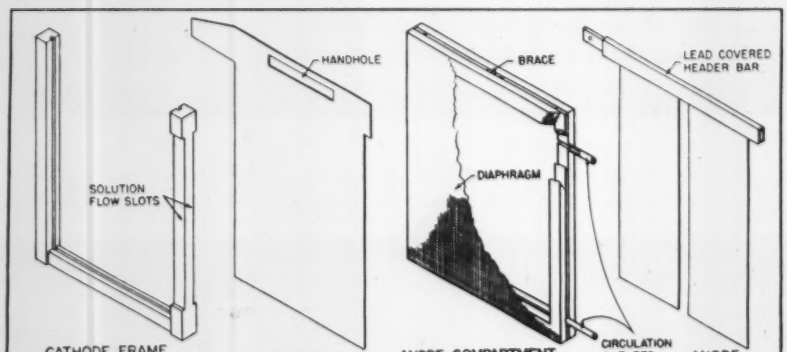
News Summary—p. 61 *Market Summary—p. 147*

New Electrolytic Process . . Produces High

Ten-cathode, 120-pound-per-day electrolytic chromium cell in operation



Flow sheet for making electrolytic chrom from ferrochrome



Details of cathode frame, cathode, anode compartment and anode for producing electrolytic chromium

High Purity Chromium

Besides cutting production cost of electrolytic chromium, recent Bureau of Mines development improves average purity of the metal over metal obtained from earlier electrowinning cells

ELECTROLYTIC chromium now can be produced at lower cost and with improved purity as a result of research and development work conducted by the U. S. Bureau of Mines. Details of the new process, which is operating on a pilot plant basis at the Bureau's Electrometallurgical Experiment Station, Boulder City, Nev., were given by R. R. Lloyd before the 98th convention of the Electrochemical Society at Buffalo, Oct. 11-13.

This work has resulted in the development of a more conventional type of electrolytic cell and other improvements which have substantially decreased the cost of producing high-purity electrolytic chromium. J. B. Rosenbaum, V. E. Homme, L. P. Davis, and C. C. Merrill, all of the Bureau of Mines, collaborated with Mr. Lloyd on the process.

Plant Under Construction—A plant for the production of electrolytic chromium will be constructed at Sault Ste. Marie, Mich. by the Electrometallurgical Division, Union Carbide & Carbon Corp. This installation is expected to be in operation next spring. Metal produced by the process is said to be of high purity. Principal uses are in several types of nonferrous chromium alloys used for metal cutting tools, heating elements and electrical appliances, and for high temperature jet engine and rocket parts.

According to Lloyd, the early pilot plant cell met the complex requirements for successful deposition of chromium metal, but it was expensive to construct and relatively difficult to operate because of the necessity for continuously operating several pumps. A simplified but improved cell design and new electrolyte, plus a further study of operating variables have substantially increased the tolerance of the cell to critical impurities and have made the production of heavier deposits a practical operation.

Production of electrolytic chromium is one phase of the Bureau of Mines study on the economic utilization of substandard chromium ores. Main emphasis in this work has been to decrease the cost of producing electrolytic chromium by decreasing both plant construction and operating costs.

pH Closely Controlled—Successful electrodeposition of chromium at a high current efficiency from a chromium sulphate solution requires control of the pH between relatively narrow limits and conservation of the divalent chromium that is formed at the cathode.

Diaphragms are essential, not only to prevent sulphuric acid formed at the anode from mixing with the catholyte but also to prevent the chromic acid formed at the anode from oxidizing the divalent chromium. In addition to preventing the anolyte from mixing with the catholyte, the diaphragm must control the quantity of catholyte that flows into the anolyte. The ideal diaphragm is one with a limited and uniform porosity.

Cell feed for the electrolytic process consists of a concentrated solution of chromium ammonium alum. Quantity of catholyte flowing into the anolyte controls the pH of the solution by controlling the ammonium ion concentration of the anolyte.

If the highly acid anolyte does not also contain ammonium ion, the transference rate of hydrogen ion into the catholyte is greater than the evolution of hydrogen at the cathode and the pH of the catholyte drops. A further requisite for deposition of metal is a rapid but nonturbulent flow of electrolyte over the cathode surface.

Plexiglas in the Cell Assembly—The electrolytic cell is assembled by starting with an anode compartment in one corner of the cell tank and alternately placing cathode frames and anode compartments until all the frames are in place. The anode compartment of the new cell consists of a frame fabricated from strips of Lucite or Plexiglas sheet with a No. 17 Vinyon cloth diaphragm cemented to each side. Two outlets are provided for circulating anolyte to a common header.

Each compartment holds one anode, which consists of a split sheet of lead-1 per cent silver alloy burned to a lead-covered copper header bar. The alloy sheet is split vertically to pass by the brace at the center of the top Lucite strips, and is suspended freely in the compartment except for the bottom edge. This is centered between the diaphragms by a bottom groove.

Electrolyte Moves Fast—The cathode frame is fabricated from Douglas fir strips, joined with Monel screws. In his discussion, Lloyd emphasized the importance of rapid, uniform circulation at the cathode. Evolution of hydrogen at the cathode causes a rapid, but controlled, circulation of catholyte in at the bottom and out at the side of the frame.

Effect of rapid movement of the catholyte is to maintain the pH at the cathode surface more nearly uniform and closer to the pH of the body of the

Macrocamera picture of two typical electrolytic chromium deposits. Top sample was deposited at the upper end of the pH operating range; bottom sample at lower end. Oxygen analysis for top sample is 0.15 per cent; for bottom 0.40 per cent. Oxygen content of the metal produced varies ordinarily from 0.3 to 0.42 per cent. At 60°C, a pH range of 2.3 to 2.35 results in a sulphide sulphur content averaging 0.03 per cent; a pH range of 2.5 to 2.6 results in a sulphur content for the electrolytic chromium averaging 0.01 per cent

solution. The result is a wider pH range for efficient plating and a greatly increased tolerance to impurities.

Cathode plates are type 316 stainless steel, each with 7.5 sq ft of submerged area. Average cathode-to-diaphragm distance is 1.1 inches. The early cell design used a distance of 0.7 inch. Lloyd pointed out that the increased power costs, due to an increase in cell potential of 0.33-v, is more than offset by decreased labor costs.

Wider spacing means better circulation of catholyte, less straightening of cathodes, and heavier deposits. In addition to the advantage of removing the cathodes for stripping less often, the heavier deposits are easier to strip and are more attractive to the prospective consumer.

Chromium Ammonium Alum—The cell feed contains chromic sulphate and ammonium sulphate in the proportions existing in the alum, $(NH_4)_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$. The catholyte solution contains chromous sulphate, chromic sulphate and ammonium sulphate. The anolyte contains chromic sulphate, chromic acid, ammonium sulphate and sulphuric acid. Chromium ammonium alum for cell feed may be prepared directly from the ore, or from sodium dichromate by use of conventional methods, or from ferrochromium.

TYPICAL CELL OPERATING DATA

Current density	80 amp./sq. ft.
Cell potential	4.8 volts
Current efficiency	60% (based on trivalent Cr.)
Kwhr/lb metal	5.6
pH	2.45 to 2.65
Temperature	59° ± 1° C.
Time of deposition	72 to 80 hrs.
Addition agent	0.03 g. Goulac/L. of cell feed

Alum to supply cell feed for current operations in the Bureau of Mines' work is being produced from high-carbon ferrochromium by a process flow sheet. It was pointed out by Lloyd that alum for cell feed prepared from ferrochrome or by acid digestion of the ore normally contains a small quantity of iron, which is deposited with the chromium, while iron-free alum may be produced from sodium dichromate.

Typical cell operating data for production of electrolytic chromium are given in the accompanying table.

Froth-Blanketed—Current efficiency is based on deposition from the trivalent state since the cell feed contains only trivalent chromium. The addition agent, Goulac, is a lignin sulphonate and is added to maintain a protective froth over the catholyte. Froth holds down spray and inhibits atmospheric oxidation of the divalent chromium.

At the current density and current efficiency shown, a 73-hour plate will weigh 5 pounds per sq ft and vary in thickness from 0.15 to 0.20-inch. Temperature control is important, since tolerance of the catholyte to heavy metal impurities, such as lead, increases, and the sulphur and iron analyses of the finished metal are shown to decrease with increasing temperature.

British Firm Cuts Stainless Manufacturing Costs

DEVELOPMENTS which may reduce the cost of stainless steel manufacture by as much as £2 per ton were recently reported by the British Iron & Steel Research Association. By substituting a single addition of the alloy ferro-silicon-chrome during the later stages of the manufacturing process, a Sheffield firm effects substantial economies in the use of expensive imported alloys.

Chromium Recovered—At the same time the valuable chromium locked up in the scrap stainless used as a raw material is more fully recovered. Between 91 and 93 per cent is now recovered against 88 per cent before.

By using ferro-silicon-chrome the steelmaker performs two operations at once. Silicon in the alloy reduces the chromium which has passed from the scrap to the slag on the metal, while the chromium in the alloy also passes into the metal and compensates for the proportion that cannot be reduced. Previously, ferro-silicon and expensive low carbon ferrochrome (imported mainly from Canada and Scandinavia) had to be added in separate stages of the process. As ferro-silicon-chrome is an intermediate stage in the manufacture of ferro-chrome its price is considerably less.

Oxygen Lance Does It—The oxygen lance method of making stainless in electric furnaces has made these further economies possible. Only during the last 3 years has it become possible to use stainless steel scrap as the main raw material in stainless steel manufacture.

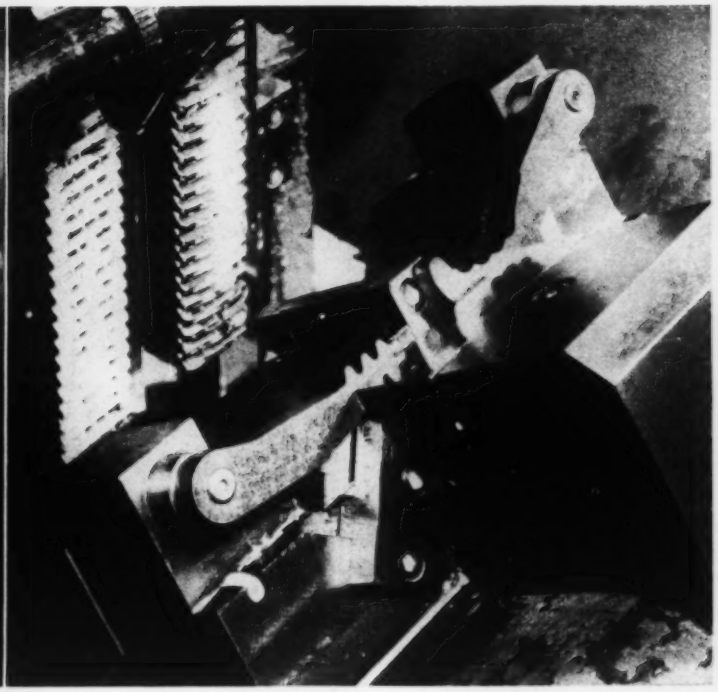
Some 30,000 to 40,000 tons of such scrap is generated in Sheffield alone in a normal year. This can now be used because of the high temperatures oxygen "lancing" generates in the furnaces. These may reach as much as 2000°C (3632°F) against the 1650°C (3002°F) previously attained.

Applies Black Stainless Marking

Stainless steel may be treated to produce permanent black designs or markings in contrast to the lustrous surface of the material by a new process, called Ateen-Ate. Developed by Stainless Ornamentals Inc., Boston, the process is expected to be used on highway signs, markers of various types, etc., where permanence and corrosion resistance are required.

It is reported that the blackened areas are actually part of the stainless steel surface and that no foreign matter is applied. The blackened portion is said to have anticorrosive qualities equal to that of the stainless steel itself. The Boston company is using stainless steel made by Armco Steel Corp., Middletown, O., in producing the easy-to-read markings on dial signs, name plates and instruments. As the process will handle up to 132-screen halftones, photographs can be reproduced on the steel.

Setup for broaching two pawl blanks. Blank, right, has its hooked end up; blank on left has hook turned down. Clamping is automatic, since fixture rocks into broaching position



Parking pawls as they appear after broaching and ready for unloading. Fixture here has rocked back and unlocked workpiece automatically

120 Transmission Pawls Broached Every Hour

Chevrolet Powerglide setup processes two parking lock pawls at a time with aid of rocking fixture

EVERY Chevrolet automatic transmission requires a pawl which locates the manual valve in the reverse, low, drive, neutral or park positions, and when in "park" range, locks the transmission through the propeller shaft and rear axle. The pawl is a hook-shaped lever blanked from steel plate 3/8-inch thick.

Teeth cut on the side opposite the hook engage the teeth of a spur gear that is a part of a planet carrier. The planet carrier, in turn, is rigidly connected through the propeller shaft to rear wheels. Notches also are cut inside the hook for engaging a detent by which the pawl is positioned in service. Each pawl has a hole for a pivot pin near the end opposite that which is hooked.

Broaches Work in Pairs—Teeth and notches are cut by a pair of broaches. One broach cuts the gear; the second forms the detent teeth. Two pieces are broached at a time but each piece is put through the fixture twice, once for each set of teeth. The setup broaches 120 pieces per hour.

In both positions, the workpiece is located at one end from the pin hole and at the other by resting against a stop. As the fixture rocks into broaching position, both pieces are automatically clamped and rigidly held while the broaches make their cuts.

Rocks Out of Cutting Range—Immediately after the cuts, the fixture rocks out automatically and the broaches return while the operator reloads the fixture. He removes the completed piece, shifts the half-completed one to the completing position and loads a new piece before the succeeding working stroke occurs.

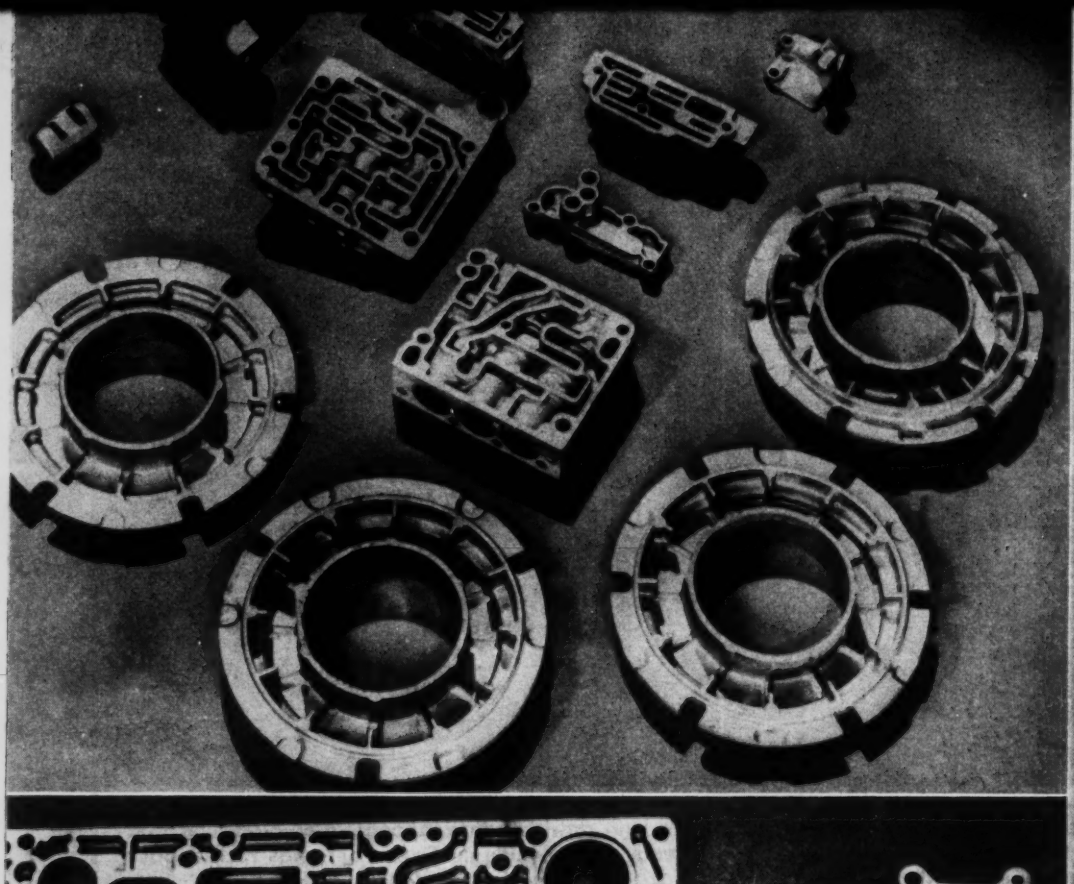
Dimensional checking is facilitated by a comparator with a suitable screen on which maximum and minimum limit lines appear at the critical contours. The operator must use this instrument on occasional pieces. If contours come outside the limits marked, broaches have to be ground and reset or otherwise adjusted. A comparator is employed because dimensional reference layout points lie outside the pawl itself; the projection facilitates checking a piece of this kind.

Data Sheet Correlates Specs

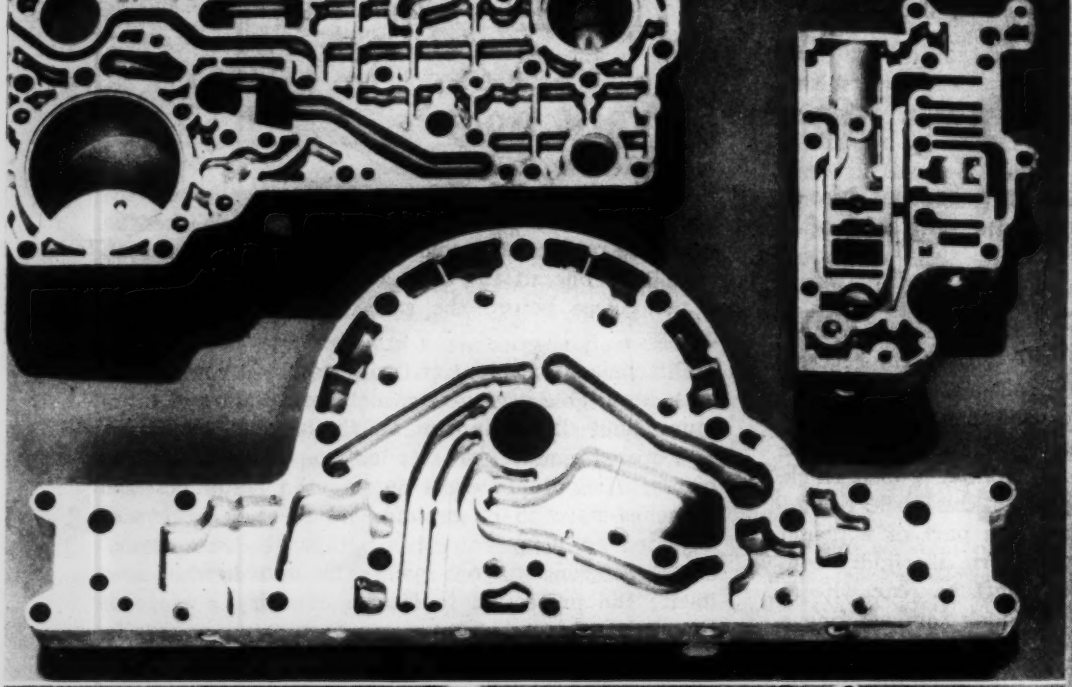
Forty different alloys of phosphor bronze, nickel silver, beryllium copper, and cupro nickel made by Riverside Metal Co., Riverside, N. J. are correlated with ASTM, federal, Army, and Navy specifications on a data sheet recently made available.

It indicates to the designer, specification engineer and purchasing agent which Riverside alloy to specify when working under those specifications. The various forms of each of the 40 alloys available are included, along with general characteristics and typical uses of the metals.

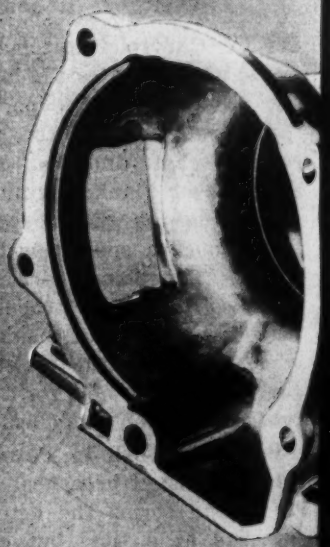
Close

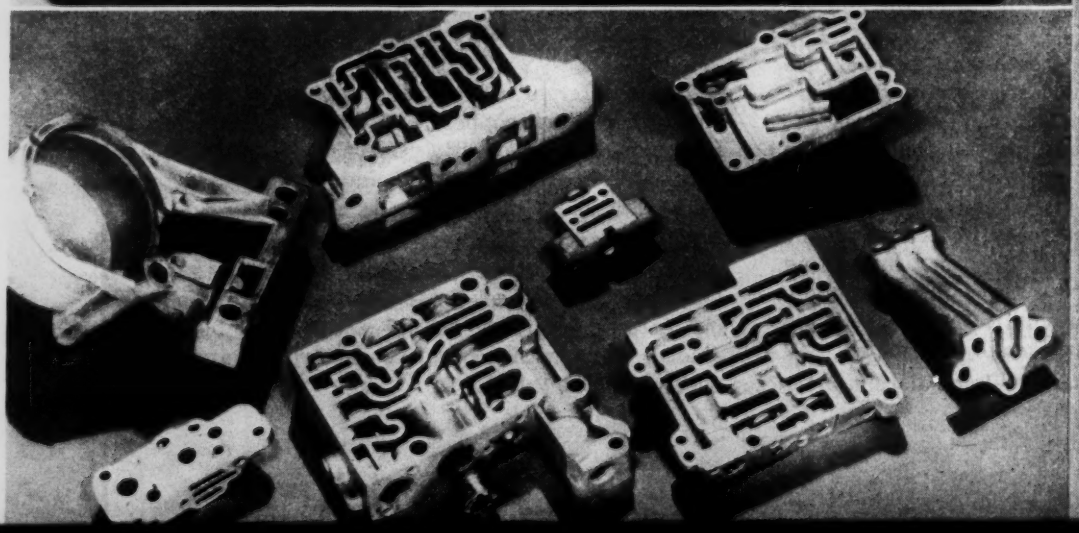


Valve castings and annular clutch piston castings for fully automatic transmission built by General Motors' Detroit Transmission Division. This transmission is used on Cadillac, Oldsmobile, Pontiac, Lincoln, Nash and Kaiser



Valve, converter and servo castings used in Buick's torque-converter type transmission





Valve castings for Packard's transmission. This unit combines features of the automatic and converter type transmission with a lock-up clutch

Tolerance Die Castings Cut Auto Transmission Cost

Intricate precision aluminum die castings play a vital role in today's automatic transmissions. Without die cast valve mechanism parts, automobile manufacturers would have to resort to larger, bulkier and costlier transmissions

TO THE average car owner, the term "automatic transmission" means any of several "no-shift" drives. To the manufacturer supplying components, the term means close tolerances, intricate designs and precision fits—all maintained at a high production level and at low cost.

Heart of the transmission is a group of complicated aluminum die castings. In 1937, when one of the largest manufacturers of automatic transmissions planned to go into production, he was faced with the problem of determining a method of fabricating the intricate control valve castings. Engineers of Doehler-Jarvis Corp., New York, were called in, and after studying the parts, agreed to make the main valve control parts as aluminum die castings.

Pinholes Out—Basic requirement was that the castings must be uniformly sound and free from porosity. Even the smallest pinhole, especially in the passages for the pistons, could not be tolerated, as porosity would allow a pickup of sediment in the oil, resulting in a sticky piston, preventing proper shifting of gears.

As a result of the difficulties encountered in early production, Doehler-Jarvis engineers continued their studies and made recommendations to the customer in the form of design changes that permitted casting all the holes in each of the different parts. Special inspection systems and devices for absolute control of density and accuracy were also developed by the company.

Stock Down to 0.007-inch—Amount of stock originally allowed for machining was 0.035 to 0.040-inch in the various piston bores. This has now been reduced to 0.007 to 0.010-inch.

Relation of the irregularly shaped parts, one with the other, in a great many instances must be held within 0.002 to 0.003-inch. These parts, due to their shape, cannot be machined; they are cast to the correct size and location. Such tolerances must be held to permit pistons, when operating in the cylindrical bore, to shut off certain oil passages and open others to allow gears to shift at the proper time. If these parts are out of location, the smooth shift desired by the car owner will not be obtained.

Left—Transmission case extension used by Warner Gear Division of Borg-Warner Corp. and Ford Motor Co. for Mercury and Ford

Below—Valve castings for new automatic type transmission with converter used in Ford and Mercury

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

SNOWED UNDER: Cleveland's predicament last week in being "snowed under" because of lack of mechanized snow moving and removing equipment, parallels the predicament facing an increasing number of production machine shops which now have inadequate mechanical facilities to keep them from being "snowed under" with chips.

Just as manually operated snow shovels no longer can cope with heavy snowfall in a big city, so also are manually operated hooks, rakes and scoop shovels inadequate to cope with the tremendous volume of chips generated in modern production machine tools equipped with carbide cutters.

Over the past 40 years, chip pans on machine tools have been growing progressively larger. At the same time, ports and chutes for manual clearing of these big chip pans have been enlarged and relocated for easier manual cleaning at less disturbance to operators. Up to the point when overall carbide tooling was adopted, these design changes helped—to the same extent that a bigger and handier garbage can might help in a bigger and busier kitchen.

Just as built-in power garbage grinding and continuous disposal units now are replacing "static" garbage cans in modern kitchens, so also are various continuous chip conveyors—in conjunction with work separators and chip breakers—taking place of oversize chip pans on many modern machine tools.

Unlike the garbage disposal units which are hooked up with the sewer system to carry away the waste material, these individual chip disposal systems in too many cases still have nothing better to hook up with than perambulating chip bins which periodically must be hauled off and dumped. Therefore, the increasingly scarce and increasingly expensive human element still is involved to too great a degree.

A number of big plants lately have been designed with various kinds of "sewer systems" for picking up the chips from the individual conveyors on the machines and mechanically transporting them to a central point for coolant recovery, crushing and briquetting. Some of these sewer systems consist of channels in the cement floor, pitched to allow coolant to flow and with screw or chain conveyors to move the chips. Others consist of ducts above the floor similarly pitched and similarly conveyorized.

These systems have their drawbacks as well as their good points. In the first place there is no assurance that various types of individual machine conveyors will link up effectively with them. Here may be an opportunity for standardization. In the second place, unless all the machines served by the system are operating on the same kind of material with the same kind of cutting oil or coolant, value of salvaged metal and coolant is reduced or nullified.

The answer to this second condition would seem to be "departmentalization" of machining processes involving similar metals and similar cutting oils or compounds. However, at a time when machine shop practice is trending away from departmentalization, this last certainly poses a problem in plants involving widely diversified machining.

Recently I have heard it suggested that the answer may lie in individual chip processing and coolant recovery units attached to high production machine tools. There would seem to be considerable merit in this suggestion in relation to some of the station-type machines—each one of which produces as great a volume of chips as a good sized machine shop produced not so many years ago. Whether it would be practiced on lesser machines may seem open to question. Remember this, however: The individual chip conveyor once was only an "inventor's pipe dream."

HEAVY PENNY: Back in the days when machine tools and other industrial machines were considered high speed if they ran 1000 rpm, symmetrical design and machining of revolving parts were considered to be fairly good insurances against unbalance.

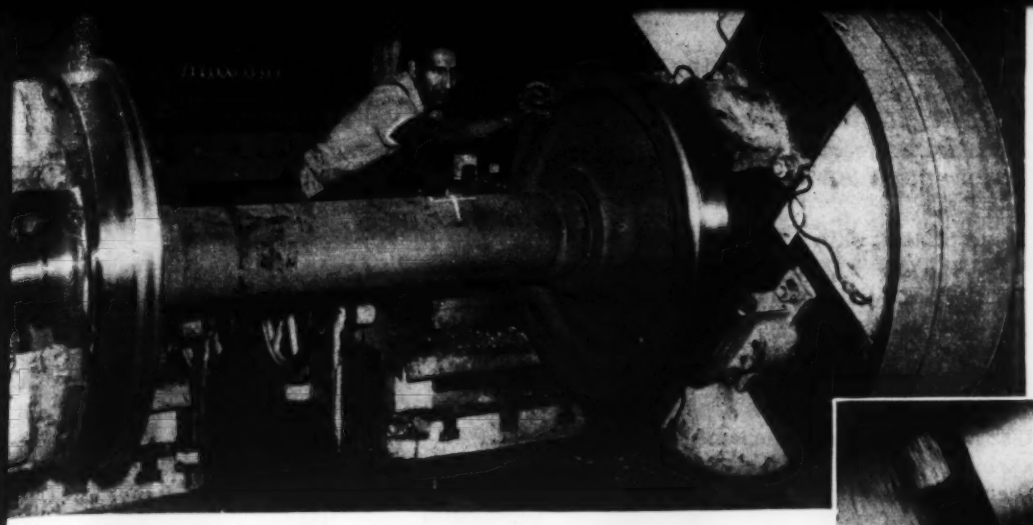
With advent of improved cutting materials—including abrasives as well as carbides—speeds of many types of metalworking machines now are being stepped up to the point where accurate static and dynamic balancing is fully as important as it is in the automotive and aircraft engine industries.

More and more, I find really scientific balancing methods and balancing apparatus in use in machine tool plants. More and more, I find machine tool and tool engineers specifying balance requirements on their working drawings.

One of the most forceful expositions as to effects of a small amount of unbalanced weight on a revolving part, is one that I am pleased to credit to Gisholt Machine Co., Madison, Wis. As designers and builders of balancing machines as well as high production machine tools, engineers at Gisholt are thoroughly versed in the theory and effect of centrifugal force.

A "static" penny—they point out—weighs only 1/6-ounce. Mount this penny at 6 inches from the center of an otherwise balanced rotating body and set it spinning. At 500 rpm this 1/6-ounce penny exerts a force of 0.44-pound. Now speed things up bearing in mind that centrifugal force—in other words the "pull" of the penny—increases as the square of rotational speed. Thus at 5000 rpm this pull becomes 44.25 pounds. At 20,000 rpm that 1/6-ounce penny is tugging furiously at the bearings with the almost unbelievable force of 708 pounds!

Many high speed spindles today not only are running at 20,000 rpm, but also at speeds as high as 50,000 rpm. The trend more and more is in that direction. At such speeds even the proverbial "flyspeck" becomes a thoroughly disturbing factor. Thus scientific balancing takes its place along with various other "laboratory techniques" in the inspection and testing departments of the machine tool builders.



Left—Two wheels are turned simultaneously on this 52-inch lathe

Below — Closeup of cutter used in re-turning railroad car wheels

Wheel Re-Turning Time Halved

Using a 52-inch lathe and carbide tooling, Southern Pacific resurfaces its largest rolling stock wheels two-at-a-time in forty minutes

WHEELS for railroad cars, diesels, tenders, etc., are now being re-turned in half the time that normally would be required, thanks to the development of an unusual production technique in Southern Pacific Co.'s Los Angeles shops.

Re-turning operations are necessary periodically because the wheels of rail-borne vehicles are subjected to extremely heavy operational loads. These loads result in a concavity of the respective wheel treads, brake burns and flat spots due to slippage—all of which can cause untold thousands of dollars' worth of damage if they are allowed to progress. The work may be regarded either as continual production or as a service operation.

Low Gear Operation—Before the new re-turning technique was developed, Southern Pacific wheels were re-surfaced by lathe equipment geared to a top speed of 2 rpm with a feed of ¼-inch. Operational sequence was:

(1) A rough cut was made on the tread section of the wheel to remove the bulk of the unwanted material.

(2) Excess materials on the flange section were removed from each wheel with a second rough cut.

(3) A forming tool covered both areas, taking a light cut for a fairly-smooth finish.

(4) A chamfer was formed with a final cut which removed very little material.

Machining took approximately an hour and 20 minutes for each pair of wheels—or about six pairs of wheels per lathe daily.

52-Incher Plus Carbides—To increase production, company officials investigated the possibility of using new lathe equipment in connection with carbide cutting tools. Available lathes were not geared to speeds essential to the efficient use of carbides.

A new 52-inch lathe with reserve strength and power at speeds up to 24 rpm was obtained. It had variable spindle speeds so that it could be adapted to the use of both high-speed steel and carbide cutting tools. A pair of massive heads mounted on a wide, sturdy bed facilitated the use of the tool for machining two wheels simultaneously.

Headstock "Slidably" Mounted—Main drive gearing was located in the left headstock, which was rigidly bolted to the bed. A power traverse operated by a separate motor was provided for the right headstock, "slidably" mounted on the bed.

Forward movement via a friction disk eliminated the possibility of lathe damage due to excessive forces in the operation of the headstock. Aft movement was governed by an electrical limit switch. A pneumatic clamp secured the headstock in fore and aft positions. Renewable hardened steel wear plates were attached to the ways of the bed under the right stock.

Steel Lining—Undersides of the T-slots were also lined with steel plates. Pneumatic driver dogs permitted the use of air pressure in holding serrated jaws in an open position (against spring pressure) so that spring pressure alone could be used to move the jaws along an angular surface to bring the jaws in contact with their respective wheel surfaces.

Springs were preloaded to a pressure greater than

that required between the serrated jaws and the wheels to drive the wheel sets. Wedge action between the jaws and their sets would tighten the driving grip as the cutting forces increased. A cushioning effect was obtained against excessive loads caused by wheel misalignment, etc.

One for Two—After appropriate cutting tools were developed it was learned that spindle feeds of 12 to 15 rpm—depending on the quality of the metal and depth of the required cut in each case—would enable the carbide cutters to produce a smoother finish in one operation than had previously been attained in two cutting operations.

High-speed steel cutters are for flange and chamfer operations. However, carbide tools are being evolved and their use should eventually boost production by another 50 per cent margin.

Figures from a time chart on turning a 90-ton tender wheel—largest and heaviest of all railroad car wheels—illustrates the increased speed thus far attained:

	Minutes
Setup time	4
Tread-cutting time	11½
Flange-cutting time	17½
Chamfer-cutting time	4
Unloading time	3
TOTAL	40

When carbide cutters are adapted to all the above operations, the respective time requirements for flange and chamfer cuts are expected to comprise 6 and 1-minute intervals.

Amber to Deep Blue—More time, the company believes, will be saved as the result of a current operator-training program. For instance, operators who understand the significance of the chip colors produced with carbide tools can regulate feed speeds with optimum efficiency, simply by reducing the speeds when chips have a bright amber color until a deep blue chip (denoting normal speed) is attained in each cutting operation.

When carbide cutting tools are used carefully, no grinding or resharpening is necessary for periods of three days per tool. Since carbide tools can make cuts just below the lowest points of wear, it is more than likely that the re-turned wheels will now be good for many extra miles of service.

Higher lathe operational speeds could be used in re-turning the wheels with carbide cutters, but are not being specified because they would require the use of coolants—which in turn would create difficulties resulting from contamination of oils in lathe circulating systems, thermal-shock fractures and the like.

Where it is impossible to avoid overheating through the use of reduced operational speeds, Southern Pacific officials say that compressed air alone has been a satisfactory cooling medium.

Extruded Bronze Speeds Jet Bomber Production

EXTRUDED architectural bronze sections are solving a tough engineering problem and cutting machining costs on the world's fastest bomber. The airplane is the Boeing B-47B Stratojet, the 600 mph, six-jet, sweptwing U. S. Air Force medium bomber.

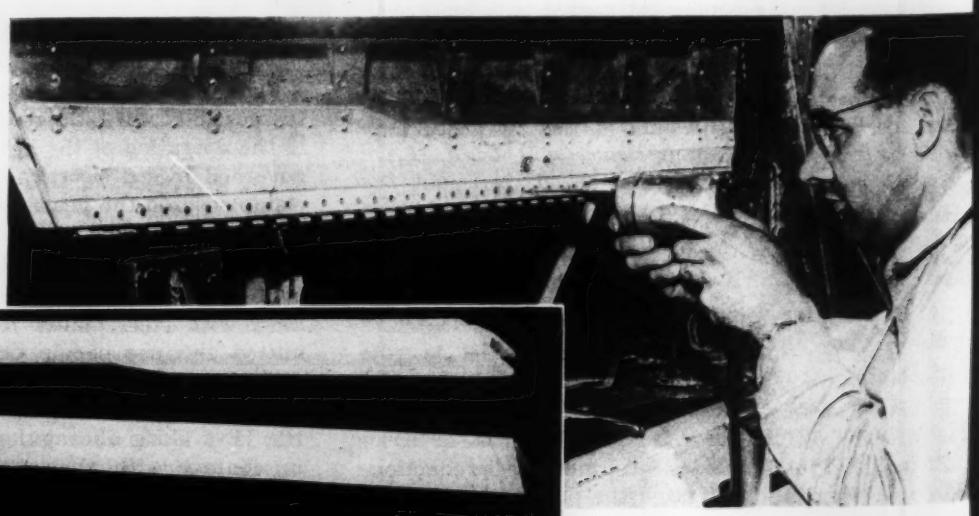
The problem: Elevators and rudder on the tail sections of airplanes employ counterweights to eliminate flutter. Steel weights normally are used. But steel counterweights in the Stratojet would have required shifting the fluxgate compass from its most ideal locations.

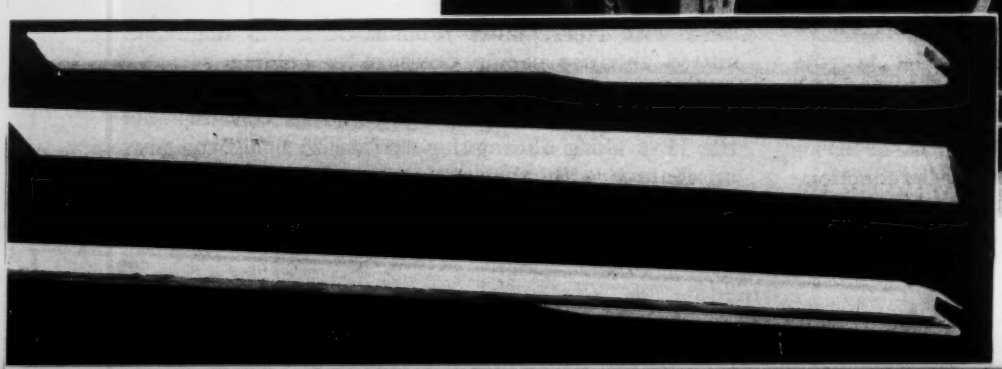
Architectural bronze alloy 283 adopted by Revere Copper & Brass Inc., New York, was along with a change in part design to make possible a shape of proper tolerance and balance. Experimental runs were made in which final design problems were ironed out. The nonmagnetic material then was supplied in the revised design.

Saving in machining time more than offsets the increased initial cost of the bronze. In addition, finished parts are delivered faster and machine tools and skilled machinists freed for other work. Net savings are great enough to justify use of the bronze even for counterweights where magnetic effect is not a factor in the selection of materials.

Right — Assembling architectural bronze extrusion sections into Boeing's new Stratojet

Below — Extruded sections such as these, used as elevator and rudder counterweights, save moving the fluxgate compass and reduce machining costs on the bomber





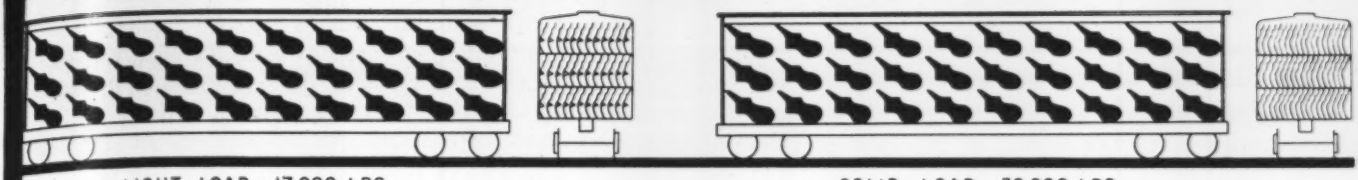


Illustration of losses from light loading, using freight car as an example

Profits from Cubic Inches

Fisher Body trims shipping costs by bringing engineering and production planning closer to materials handling. Danger of paying a freight bill for an "air" shipment is avoided by studying products to be shipped, especially if odd-shaped, large and bulky

HANDLING automobile body parts and subassemblies in manufacturing, storage, shipping and assembly can have a profound effect on profits and losses. So said E. R. Frost, director of materials handling, Fisher Body Division, General Motors Corp., at Westinghouse's third biennial materials handling conference in Buffalo, October 24 and 25.

Components of an automobile body, Mr. Frost pointed out, are large, bulky. The formed surfaces are subject to dinging and denting. Handling is especially important from the standpoint of the storage space required and protection given body parts to reduce possible damage to them. This means the development of suitable sturdy containers.

Nesting and Air—Weight-to-bulk ratio is important in the cost of transportation. Because of the size, bulk and shape of the steel stampings and assemblies, there is the danger of paying for the shipment of "air," represented by the unused space between parts packed into a railway car or truck.

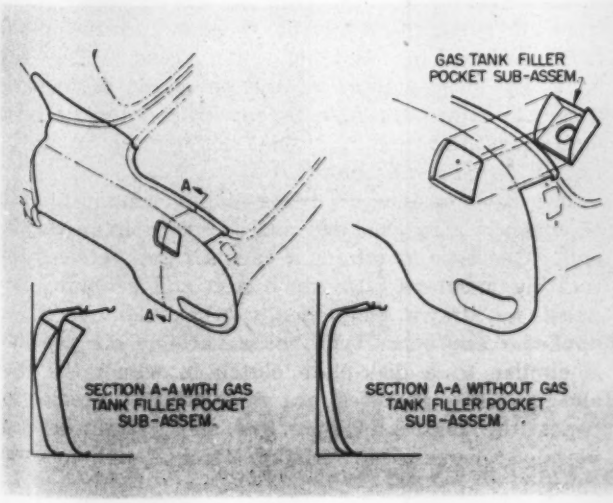
Components and subassemblies must be arranged to "nest" with a minimum amount of air space between them, whenever this can be done without interfering with the design or increasing assembly difficulties.

The "nesting" factor is divided into two parts, Mr. Frost declared. First is the design of sheet steel components making up the body shell. This is decided early in the program. Second comes the matter of decisions relative to installation of braces, brackets and reinforcements. Viewing the problem as a whole, the engineers must decide whether this or that structural member is to be installed at the fabricating or assembly plant, which is the most efficient, and how costs compare.

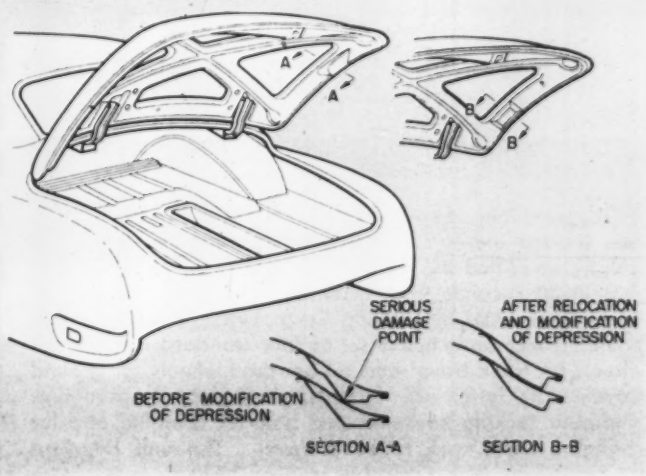
Many Cooks Don't Necessarily—At Fisher Body, determining the correct course to pursue is the joint responsibility of body engineers, die design and production engineers. Management of the fabricating and assembly plants and the materials handling department also have a say-so. The latter acts in a liaison capacity between the various groups and is responsible for the design and construction of materials handling equipment.

Tracing the less apparent factors, Mr. Frost revealed that the production engineering section produces nesting diagrams of all major assemblies as body parts drawings are received from the engineer-

Drawing showing nesting in packing quarter panels with or without brackets or reinforcements


GAS TANK FILLER POCKET SUB-ASSEM.
A
A
SECTION A-A WITH GAS TANK FILLER POCKET SUB-ASSEM.
SECTION A-A WITHOUT GAS TANK FILLER POCKET SUB-ASSEM.

Removal or modification of hinge embossments on deck lids can eliminate the serious damage point



ing division. This is done prior to the physical availability of productive parts. It assists in bringing out facts that are not apparent from the body part drawing.

A committee for allocation of body construction settles questions requiring assistance and acquiescence of more than one of the interested parties. Committee chairman is a member of the general manager's staff. Members include representatives of die and production engineering, general factory managers in charge of both fabricating and assembly plants, traffic section, material handling department and cost analytical section. Recommendations of this committee are brought through the production engineering section to body engineering for final approval in all cases where structural changes in body designs are involved.

Do You Want Standard Thicknesses?

In commenting on whether or not thickness in flat metal should be standardized, I. V. Williams, chairman of sectional committee on wire and sheet metal gages, B32, of the American Standards Association, lists six reasons in favor of the procedure: 1. Fewer items of raw materials will have to be handled by producer, warehouseman and consumer. 2. Few items will need to be stocked and raw material records can be greatly simplified. 3. Warehouseman and consumer can obtain a greater flexibility from stock items in that one raw material item can be used to make many different parts.

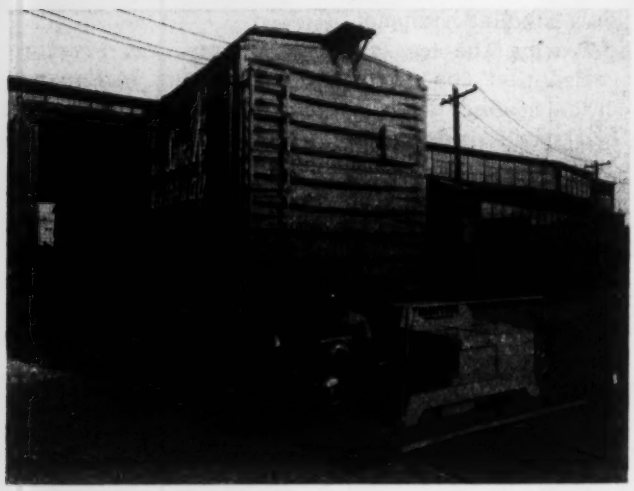
4. Both engineer and designer will have only one table of raw material sizes to consider instead of referring to a different series of sizes for each raw material under consideration. 5. It will make it easier to mate parts of different materials, as they will all be available in the same thicknesses. 6. In times of scarcity it will be possible to substitute one material for another without redesign.

A great deal of controversy has arisen over the practicability of the 1942 American standard for preferred thicknesses for uncoated thin flat materials (under 0.250-inch), sponsored by American Society of Mechanical Engineers and the Society of Automotive Engineers. In an attempt to revise this standard and bring it up to date, the sectional committee that developed it has been reactivated and will formulate a new program.

This committee now recommends that the 20 series of preferred numbers used in the present standard for the series of thin metal thicknesses be expanded to the 40 series. This means an additional thickness is added between two consecutive sizes of the present series, thus giving the user a wider choice. The values of the proposed new series are said to approach very closely the thicknesses given by the manufacturers' standard gage sizes and American wire gage sizes.

Mr. Williams would appreciate any comments on the standard. Address him at Bell Telephone Laboratories Inc., Murray Hill, N. J.

Quick Change Spotter



Complications of spotting, switching and hauling railway cars around industrial plants and railroad yards will be greatly simplified by this gas-powered machine which can shift in 30 seconds from track to ground operation. Introduced recently by Whiting Corp., Harvey, Ill., the 6000-pound Trackmobile has a set of four standard contour car wheels for track travel and rubber-tired wheels for ground travel. The latter are retracted during track operations. Hydraulic jacking power is used both for coupling and for changing from track to road travel. The unit develops a maximum draw bar pull of 7350 pounds

Iron Graphite Used in Clutch

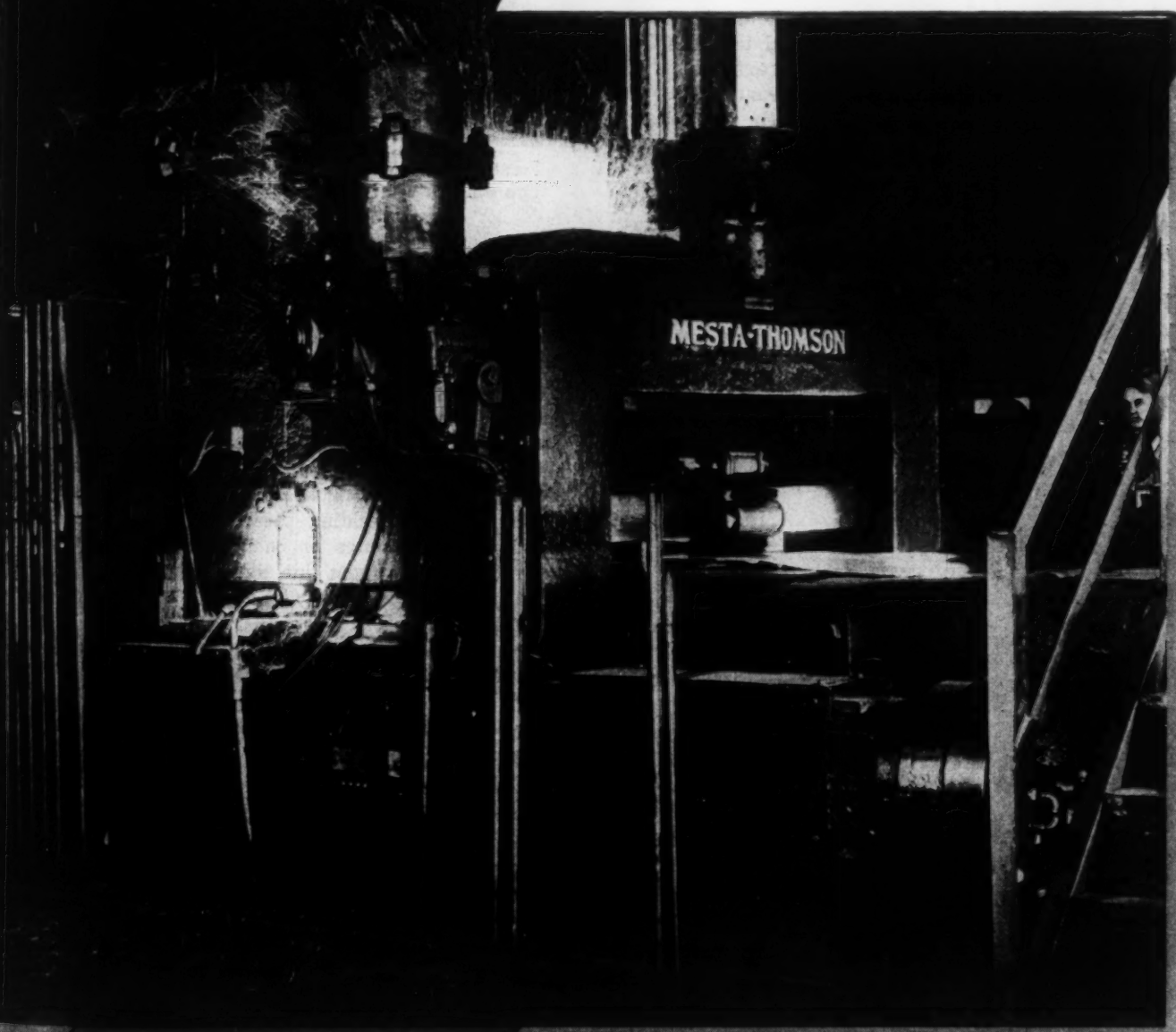
Graphite, a lubricant used in many forms to eliminate friction, is now being employed to produce friction without wear in the electromagnetic clutches and brakes made by Eaton Mfg. Co., Cleveland. According to a patent recently issued the company "a quantity of solid dry powdered lubricant such as graphite . . . when mixed with fine magnetic powder in the proper proportions, is responsible for establishing a lubricated load-transmitting bond, this material comprising finely divided magnetic particles and finely divided solid lubricants."

Among the advantages of this type of equipment, Eaton reports, are insignificant wear, freedom from drag, simple remote control, instantaneous response to control current, ability to absorb torsional vibrations and constant or variable speed and torque output from constant or variable input speed. They are made by a subsidiary of the company, Dynamatic Corp., and are available in capacities ranging from instrumentation and fractional horsepower up to the largest power requirements.

Two basic designs are being made, common to each of which is a magnet coil and complete magnetic circuit. One type maintains a fixed air gap between the rotating members into which iron and graphite particles are drawn magnetically when the current is applied. The other type has a variable air gap and is similar to a disk-plate clutch in which the iron and graphite particles are magnetically drawn between the plates as they are magnetically closed, thereby renewing the "friction linings" each time the current is applied.

Increase

Cold Mill Production with . . . MESTA-THOMSON FLASH WELDERS



Mesta-Thomson Flash Welder installed in a Mesta High-Speed Continuous Pickling Line

MESTA MACHINE COMPANY

PITTSBURGH, PA.

Designers and Builders of Complete Steel Plants

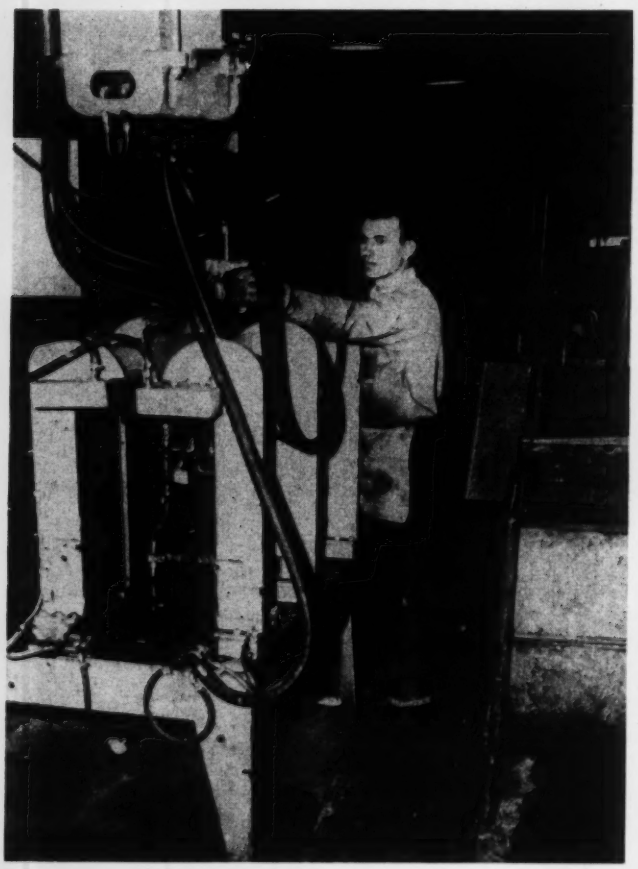
More Kitchen Cabinets In Less Time

MODERNIZED manufacturing methods, based on resistance welding, are helping Lyon Metal Products Inc., Aurora, Ill., to assemble kitchen cabinets at less cost. More rigid and sturdier construction, more uniform quality, simplified handling and shipping and faster production of cabinets are some of the advantages Lyon enjoys as a result of their improved fabricating methods.

Jig-Squared Production—Sides and back are placed in an expandable fixture designed to accommodate all sizes of Lyon cabinets. The jig holds the body square while the back is being welded to the sides. Welding is done with two spot welding arms mounted on a carriage. Two spot welds are made simultaneously with this arrangement, one on each side of the cabinet; the carriage is then moved to make two more welds, etc.

Next, the cabinet body is removed from the jig and placed on a conveyor which takes it to the next station where the top and bottom of the cabinet are attached by means of a conventional spot welder. From this point, the conveyor carries the cabinet to a portable gun welder where the top and bottom are spot welded to the face of the cabinet proper. Automatic conveyors then move the assembled body through cleaning, bonderizing and painting booths.

Sides and back for kitchen cabinet bodies being placed in an expandable fixture designed to accommodate all sizes of Lyon cabinets. Jig holds body square while back is being welded to the sides



Front cross channels and gussets are spot-welded into position with portable guns on a massive tilting and rotating welding jig

Gussets Spot-Welded—Base cabinets for the kitchen cabinet assembly are welded in the same manner except that the front cross channels and gussets, are spot-welded into position with portable guns on a massive tilting and rotating welding jig.

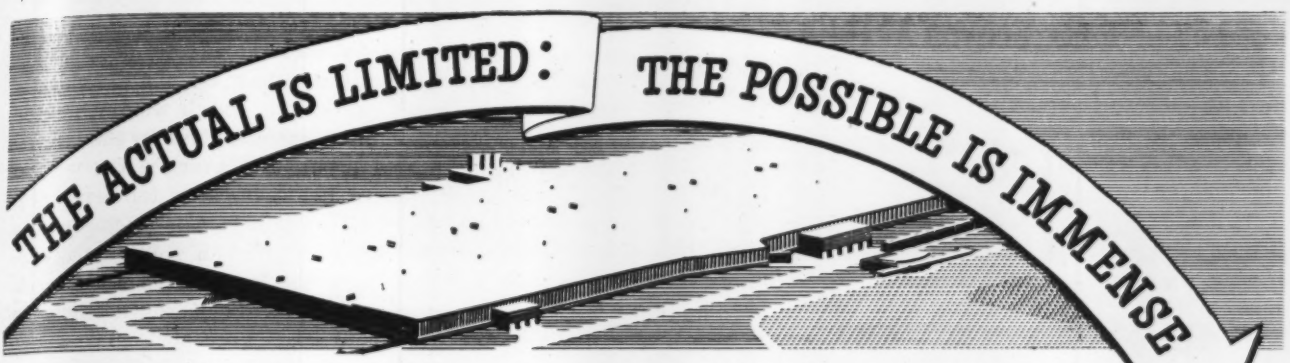
Clamping and welding these parts to the cabinet saves several minutes on each cabinet for this one operation alone. From this jig, the base cabinets go directly to the automatic cleaning, bonderizing and painting conveyor.

Present procedure is to hand-spray the cabinets while they pass through the spray booths on the traveling conveyor. Doors and panels, however, are sprayed automatically. From the spray booths, the parts go directly to the baking ovens.

Facilitates Flow—Resistance welding has greatly facilitated the continuous line flow of cabinets through the plant, avoiding much storage between operations to maintain balanced production. All parts converge toward the center assembly point where they are removed from the conveyor and inspected rigidly for any flaws in painting.

Handles 24,000 Tons of Ore Daily

Capable of handling 22½ tons of ore per load and transferring 24,000 tons per day is the second of two new ore bridges installed at Gary Steel Works of Carnegie-Illinois Steel Corp., Gary, Ind. The 25-ton bucket is operated through two 5 foot 1⅝-inch pitch diameter cable drums. Each drum is driven by a 325 hp motor and a 24-inch center distance Cone-Drive speed reducer with double-enveloping gearing, a product of Michigan Tool Co., Detroit.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1950

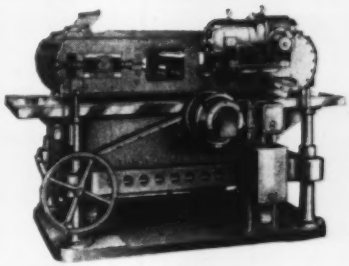
MACHINE BUILDER CUTS DEFLECTION 80%

BASIC objectives of increased rigidity and greater machine accuracy are today being achieved at lower cost with welded steel designs. As illustrated in the redesign of the Facing Planer for the Porter Machinery Company, the present welded steel table when supported on three corners indicates a deflection of only .014" where as the former cast construction sagged as much as .070". Simultaneously, a reduction in weight from 410 lbs. to 320 lbs., made possible by the increased stiffness of welded steel, enables a tolerance of .001" to be maintained on surface flatness.

How to Steel Design With Welding is presented in the new 9th Edition "Procedure Handbook of Arc Welding Design and Practice." Contains latest data on machine design together with cost figures. Price only $2.00 postpaid in U.S.A.; $2.50 elsewhere.

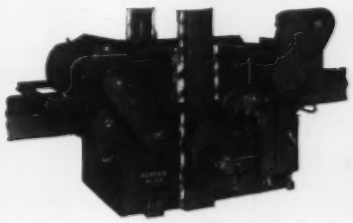
Left: Checking table deflection at Porter Machinery Company, Grand Rapids, Michigan. Center: Unsupported corner of former 36" planer top sags .070". Right: Present welded steel table deflects only .014".

the ACTUAL



Former Design. *Had heavy base serving no other purpose than to unify planer.*

increasing the YIELD



Present Steel Design *has rigid box-type base . . . eliminates costly weight.*

the IMMENSITY of the POSSIBLE

HIGHER MACHINE ACCURACY

SEE HOW WELDED STEEL CUTS MATERIAL NEEDED

Machine Design Sheets free on request to designers and engineers. Write Dept. 613,

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 1, OHIO

Longer Life for Frozen Steel

Freedom from embrittlement failure in iron and steel at subzero temperatures is closer to realization, according to data in a recently published report of Society of Automotive Engineers. It is said to hold the answer to low-temperature problems of engineers and metallurgists concerned with military and civilian ground vehicles, aircraft, welded marine vessels, ship plate, and chemical processing equipment.

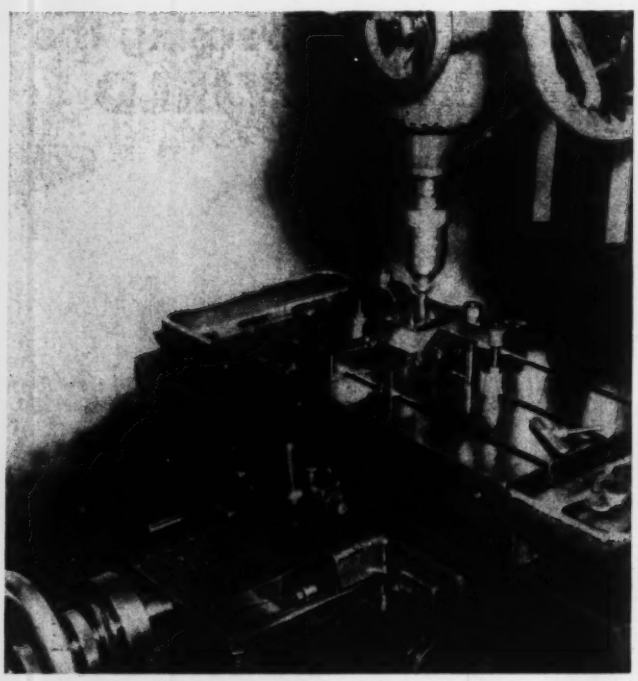
Entitled "Low-Temperature Properties of Ferrous Materials," the report evaluates effect of metallurgy, heat treatment and design on low-temperature behavior of ferrous metals. It states that resistance to embrittlement at low temperatures depends more on the degree of carbon dispersion than on the quantity present. A fine spheroidal dispersion of iron oxide is least detrimental to low temperature properties.

Also disclosed are effects of manganese, silicon, sulphur and phosphorus, chromium, molybdenum, nickel and copper, vanadium, columbium, titanium and other alloying elements. Grain structure and hardenability are other items discussed.

Concerning heat treatment, the report states that higher impact properties result from a constant quenched structure. Higher tempering temperatures produce lower tensile and yield strength. The behaviour of welded assemblies, particularly ship structures, is complicated by thermal effects, design, dissolved gases and variations in base metal and weld material. Ways to get crack-free, tough weldments for various material combinations are given in the report, thought to open new production avenues for welded equipment operating at below-freezing temperatures.

One chapter deals with methods of reducing stress concentrations and selection of steels for low-temperature service. Designers are warned by the report that cold aggravates the hazards of sharp fillets in ferritic steel parts and that large steel masses are more prone to brittle fracture with little warning. It recommends high-strength thin sections instead of lower-strength heavy sections for parts with good temperature toughness.

Eliminates Die Annealing



Don't anneal that hardened die before repairing or changing it! By using technique developed and being made available by Parsons Tool Inc., Berlin, Conn., dies hardened to 62 Rockwell C are being machined in routine operations. Carbide tools designed by the company's two Parsons brothers are milling, drilling, boring and counterboring dies without annealing, resulting in faster work that is less expensively performed. Here a hardened die is being milled for insertion of a "dutchman" or plug, modifying the design. Neither work nor tool heats, although chips are cherry red

Now Your Lathe Can Wind

In order to fulfill a need for a faster and more accurate solder winding machine, the Rochester Lead Works, Rochester, N. Y., developed such a machine using a South Bend bench lathe as the foundation. A special electronically controlled measuring device designed to work in conjunction with an electric braking mechanism was mounted on the lathe. This combination of units is reported to have resulted in a winding machine capable of producing 216 1-pound rolls of solder, with or without spool, per hour.

As set up, the equipment accurately controls weight to not exceed one-eighth ounce over. Present production may be contrasted with the former equipment by stating that previously 250 rolls of solder were spooled per day, and weight accuracy was considerably less.

Lathe was chosen for the foundation of this machine partly because of its wide range of power longitudinal feeds. The use of standard quick change gear box feeds, plus the ease with which special ratio intermediate gears can be obtained is said to reduce the expense and volume in obtaining proper feeds for the various diameters of wire solders to be spooled.

Research in Engineering Education

"Research Is Learning" is the title of a nontechnical publication of the Engineering College Research Council of the American Society for Engineering Education which has as its central theme the definition of the roll of research in engineering education.

According to the report, engineering research has as a basic purpose the discovery of fundamental information as well as the development of specific products useful to mankind. Thus, it continues, creative research aids an engineering school to fulfill its educational objective.

Included in the 32-page illustrated publication are 12 brief summaries of research activities carried on in universities, these being designed to provide specific examples of the above. Covered are individual research activities in a wide variety of technical fields, selected from suggestions made by 83 engineering schools that hold membership in the council at 77 Massachusetts Ave., Cambridge 39, Mass.

GREATER VERSATILITY

Kearney & Trecker's new CK milling machines are designed for most effective use of modern cutting tools. Their wide speed and feed ranges are closely suited to nearly all general purpose milling on most kinds of ferrous and non-ferrous metals and alloys. On all CK machines you can select from 24 spindle speeds ranging from 15 to 1500 rpm on No. 2 and 3 size machines — and 13 to 1300 rpm on No. 4, 5 and 6 sizes. For quiet effortless speed changing, the new automatic Protecto-mesh shift eliminates gear clashing. All CK machines are equipped with the extra-wide feed range, 3/8" to 90" per minute, with separate motor drive for feed and rapid traverse movements.

A new line of knee-type milling machines

KEARNEY & TRECKER MILWAUKEE **CK's**

New Model CK
10 hp No. 2 Plain Style
Milling Machine

YES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them *more productive, more profitable for you.*

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New CK columns give you greater rigidity. Compared to former columns, they give you 1000 pounds more metal in heavier ribbing, in box-type, sponson construction to absorb vibration from heaviest cutting loads.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that shortens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice . . . how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

REPLACEMENT OF OBSOLETE MACHINE TOOLS IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Faster Cooling Key To Jacquet Continuous Casting Method

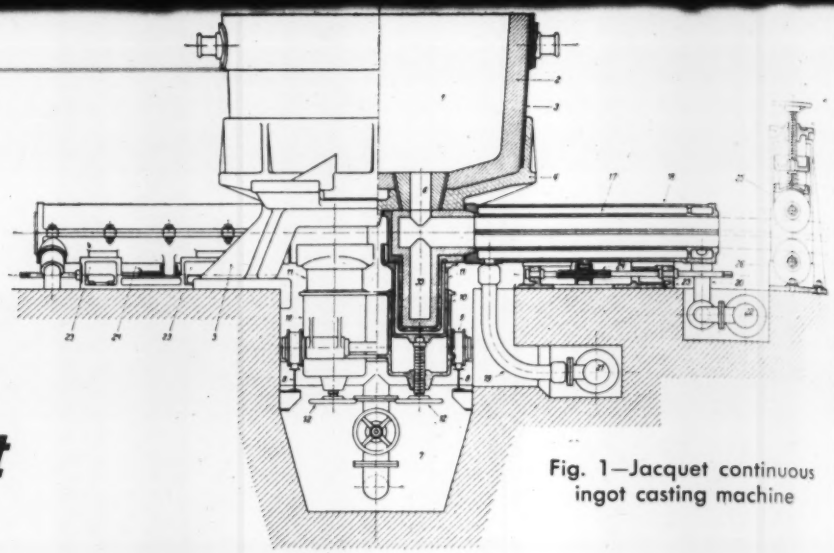


Fig. 1—Jacquet continuous ingot casting machine

Molds directly connected with ladle and arranged in horizontal position protect molten steel against oxidation before solidification. Rapid cooling of ingots gives uniform crystalline structure, limits segregation

USE of multiple horizontal molds in the continuous casting of liquid steel affords an increase in the cooling surfaces and bolsters the efficiency of the cooling system in general. Herein is where the Jacquet method of continuous casting of steel differs from other continuous processes with which at least two steelmakers in this country are engaged in perfecting.

Accompanying illustrations show the Jacquet method of continuous casting with a 6-ingot setup designed by J. F. Jacquet, technical secretary, Belgian Blast Furnace and Steelwork Association, Brussels. The ladle built with a steel plate sidewall and cast-iron bottom to withstand deformation is refractory lined. The exterior of the bottom where it bears on other parts is machined. The ladle support may be either cast iron or cast steel. The ladle bottom is provided with six holes for nozzles of large diameter through which molten metal is fed into the molds.

Cylinders Mounted on Carriage—Beneath the ladle is a pit containing a track on which a carriage mounted on rollers moves. (Fig. 1) Six cylinders are placed on this carriage in each of which a plunger (11) is raised or lowered by a handwheel. The upper part of the plungers are adequately shaped to receive a metallic box (13, Fig. 3) which it has to support.

To prepare the equipment for a casting operation, the ladle is placed on its support. The metallic boxes are placed on the upper part of the plungers. The carriage is positioned away from the ladle. After brick are placed in each box the carriage is moved forward beneath the ladle until a stop brings it to rest in the desired position. Handwheels, plungers and boxes then are lifted until the top face of the brick comes against the machined base face of the bottom of the ladle.

The upper face of the brick is slightly coated with mortar before hand to obtain a tight contact between those two faces.

Molds Are Water Cooled—Each of the six ingot molds (17, Fig. 2) is provided with a jacket (18) connected through elbows to a cooling water feed and outlet pipes. The molds lying on cradles (23) are moved lengthwise by screws (24).

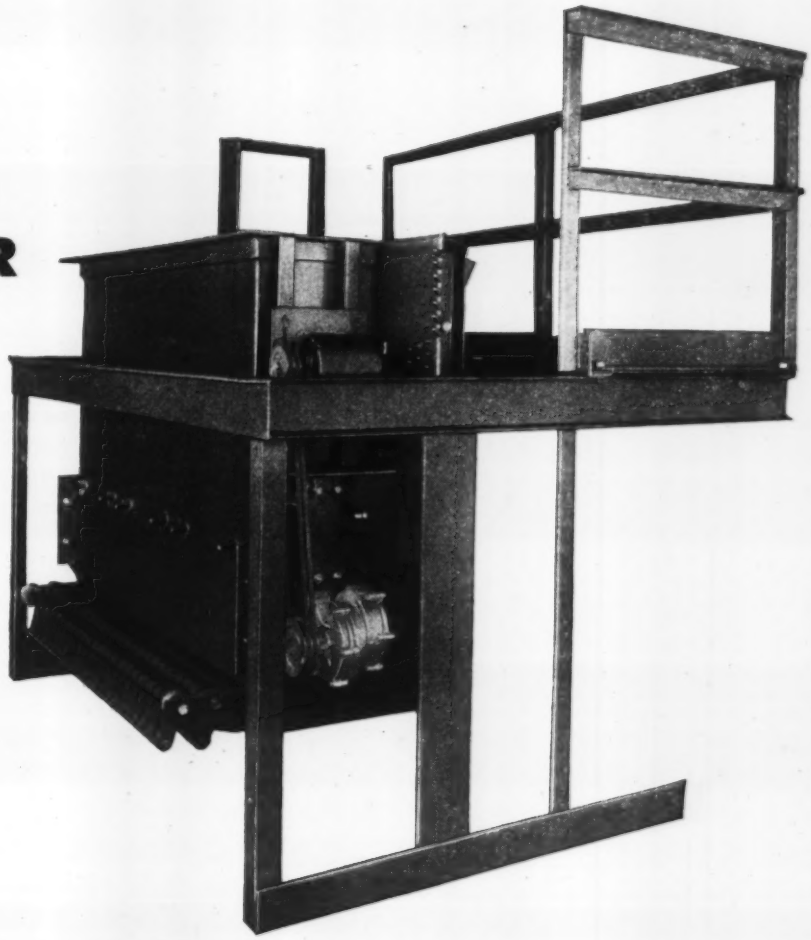
When the bricks (14) have their upper faces pressed against the bottom of the ladle, the ingot molds (17) are brought nearer to the bricks the truncated conical end of which is also coated with mortar, to insure a perfectly tight joint. The ingot molds are secured against any backing away movement by necessary means.

A stopper ingot (always the same) is inserted in each mold to fill its inside space. That stopper ingot extends to the outside so that its end is between the two pinch rolls (25 and 26), the opening and speed of which are variable and are rotating in opposite directions. Fig. 3 shows how the stopper ingot (29) is fitted.

Protects Dummy Ingot—The refractory part (30, Fig. 3) which lengthens it and which has a similar cross section is intended to prevent the liquid steel from coming in contact directly with that stopper in-

McKee solves another sintering problem

with this new *aerating* FEED HOPPER



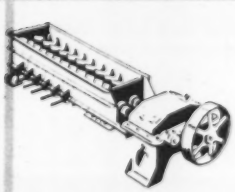
ONE of the chief problems in sintering has been to retain uniformity and porosity of the mixture of materials in feeding the charge to the sintering machine pallets.

Though we are primarily engineers and contractors—not equipment manufacturers—we developed the Aerating Feed Hopper because we found no equipment available which would perform this function satisfactorily.

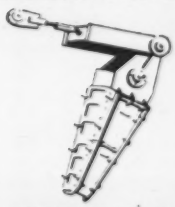
By means of a vibrating fluffer bar, the McKee Feed Hopper breaks the fall of materials from the swinging spout and prevents excessive segregation of fines and packing. The materials are evenly distributed across the full width of the pallets in a light, uniform, fluffy condition permitting free flow of gases through the charge.

This equipment provides better control of sinter structure, permits lower operating temperatures and increases sintering plant production. It is another example of McKee's engineering policy of developing *satisfactory equipment* for McKee plants if it is not otherwise procurable.

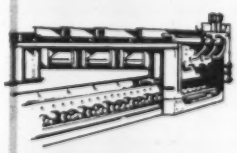
Other exclusive McKee equipment developed to meet definite needs in Sintering Plants:



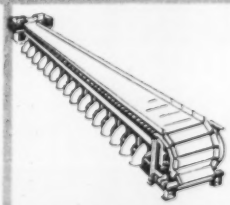
PUG MILLS



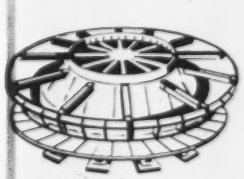
SWINGING SPOUT



IGNITION FURNACE



SINTERING MACHINE



ROTARY AIR COOLER

ARTHUR G. McKEE & COMPANY

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

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& Steel Division of Arthur G. McKee & Company is represented in England by the McKee Iron & Steel Division of HEAD, WRIGHTSON & CO., LTD.

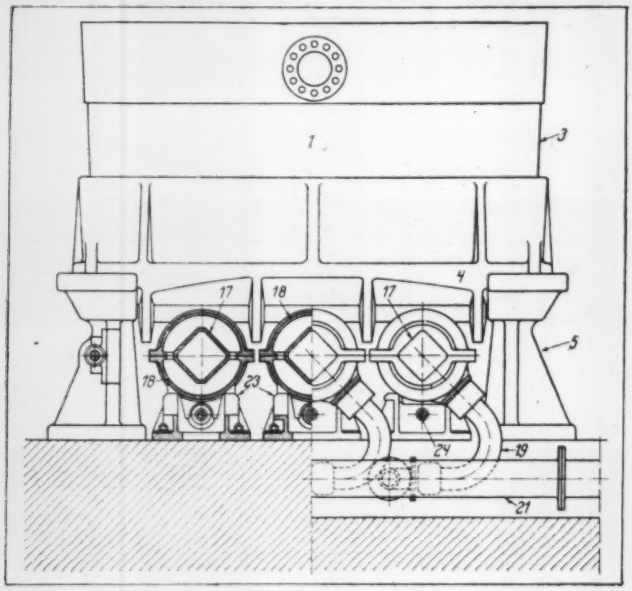


Fig. 2—Section through ingot molds

got, as soon as metal begins to flow. The refractory part and the stopper ingot (29) are connected to each other by a metal part (31), one end of which is screwed in the stopper ingot, the other end being bent as indicated on the design. The ladle nozzles are closed by stoppers whose lower part is made of cast iron with a refractory head screwed on it. The base of each stopper bears on the metal part (31) which also serves as a support.

During the filling of the ladle, the metal should be prevented from seeping through between the stopper (27-28) and the wall of the discharging hole or nozzle. For that purpose, the cross section of this discharging hole is not uniform over its entire length. The bore of this hole is slightly larger at the top as indicated on Fig. 3 so that it is possible to press a refractory material (32) in that place in order to insure a perfect sealing which would not be possible even if there would be a minimum clearance between these two parts.

How Machine Operates—The equipment being thusly prepared, the metal to be cast into ingot molds is poured from the ladle. To begin the operation, water is allowed to flow into the jackets (18), then the pinch rolls are started and they pull away the stopper ingots (29). As soon as the stoppers (27-28) are no longer supported by the metal part (31), they fall into the recesses (33) provided for below, in which they remain during the duration of the casting operation. The steel thus flows through nozzles (6), through the bricks (14), and following the refractory parts (30) arrives in the ingot molds, where it solidifies under the effect of the cooling water circulating in the jackets (18).

With the conventional ladle usually used for steel, it happens that when the fluidity of the metal is not sufficient, the metal freezes in the nozzles during the casting operation. Such plugging results from the fact that the steel flow is intermittent and is effected through holes, the diameter of which is necessarily too small. The device allows this diameter to increase considerably and since the casting operation is continuous, such plugging normally cannot take place. Nor is it to be feared that the stoppers would remain suspended in the nozzles, when they are no longer supported by the metal parts (31), as they will be under more than ample pressure to insure their fall into the recesses (33).

Cake Easily Removed—It is also relatively easy to remove the solidified metal that might stick to the walls and to the bottom of the ladle after the casting operation, even in the case when the metal cake would extend into the nozzles and bricks (14). After the boxes (13) have been lowered, it would only be necessary to break the bricks (14) and then to cut off the metal caked from the ladle, either by a torch or by any other means. The cake could then be removed by the usual means.

Difficulties pertaining to steel ingot casting on a commercial scale come mainly from the extent of the amount of heat to be absorbed by the coolant and which is much higher for steel than for other nonferrous metals, for the same quantity of metal to be cast into ingot molds.

Undergoes Temperature Drop—During its flow into the ingot molds, the steel has to undergo a drop in temperature of approximately 1100° F. The steel, therefore, has to be subjected to the effect of the coolant for a longer time than the nonferrous metals. As a result, the stripping of the steel can be effected only at a comparatively reduced speed. The too rapidly stripped ingots would show a central cavity, the elimination of which constitutes the essential object of the continuous casting.

From the foregoing, the conclusion follows that the production of steel ingots on a commercial scale by means of a continuous casting device with one ingot mold is impossible owing to the fact that the casting operation could not be completed within the time available.

Time of Pour—It is also obvious that the time available for emptying a ladle of liquid steel is in propor-

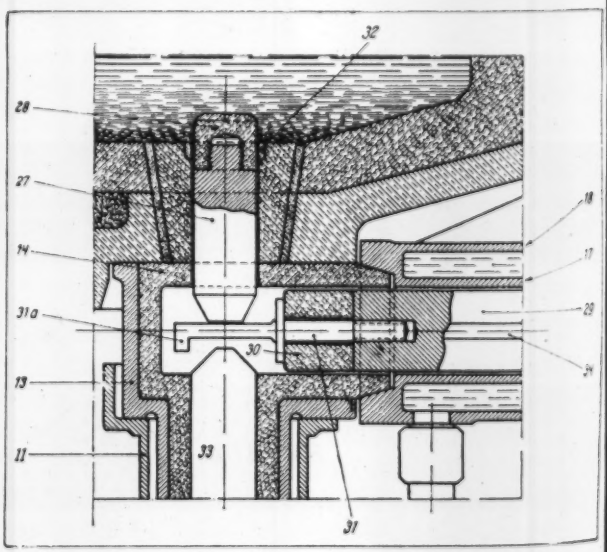


Fig. 3—Details of stopper ingots

tion to the quantity of metal contained in that ladle. This time will be all the longer as the quantity of steel of the charge is increased. In the case of equipment with multiple ingot molds, each mold has to cool only part of the charge. The more ingot molds the equipment comprises, the smaller will be the quantity of steel cast into them and the cooling of this smaller quantity of steel per mold can be effected during the time available for emptying the ladle. This teeming time (without reheating) would be considerably longer for the same charge when using a casting device comprising only one cooled mold than with the multiple mold design.

Therefore, equipment comprising an adequate number of ingot molds will enable the performing of casting of steel on a commercial scale, without the necessity of reheating the charge and without exceeding the maximum stripping speed.

Molds and Ladle Connected—The fact that in this method the ingot molds are connected with the ladle without interruption of the continuity offers essential advantages. During the greater part of the operation, the metal contained in the ladle will exert on the ingots being cast such a pressure that the skin of these ingots will remain in contact with the wall of the ingot molds over a much larger surface than in the equipment where that direct connection is not provided for.

On the other hand, the risks of cracking and breaking the ingot skin will be much reduced in view of the pressure to which the ingots being cast are subjected. Furthermore, the flow of metal will take place in "closed vessel". Before its solidification in the ingot molds, the liquid steel will therefore be protected from oxidation.

Ingots Poured Horizontally—Another advantage is that the ingot molds are positioned horizontally. As a result, cutting the ingots is not necessary during the course of the operation; this can be done when the operation is completed. If necessary, the six ingots of the same casting can be cut into pieces in variable lengths. Besides, with horizontal ingot molds, the metal to be cooled will be in contact with the inside walls of such ingot molds over a large surface. With the ingot molds positioned as shown in Fig. 2, this contact is assured for the two lower faces of ingots over the entire length of the molds.

In view of the fact that the ingot molds are directly connected with the ladle and are positioned horizontally, the cooling will take place with the maximum efficiency as both features are liable to increase the effective cooling surface of each ingot mold.

It also is to be noted that the casting operation for steel ingots will not only be somewhat mechanized but will be performed automatically which is one of the most important advantages of this device. Further details on the Jacquet process may be had from Belgameric Inc., 350 Fifth Ave., New York.

Century of Tests in Short Time

Effects of as much as a century of actual service are being subjected to copper expansion joints of various designs by a flexing test developed by Revere Copper & Brass Inc., New York. Object of the research was to determine what kind of bend, description and weight of metal would best withstand the flexing caused by temperature changes. Expansion joints were of the type used in concrete slabs and walls, masonry walls and other places where weather conditions require provision for alternate expansion and contraction.

With the specially designed, electric motor-operated apparatus, the bends were flexed at the rate of six cycles per minute, so that within a few weeks it was possible to run up as many as 40,000 flexures. Conclusions were: That the greater the height of leg, the greater the number of flexures sustained before failure; the greater the radius of bend at the crown, the greater the number of flexures sustained before failure; joints formed from copper of cold rolled temper usually sustained a slightly greater number of flexures before failure than those made from soft temper; the thinner the gage of the copper, the greater the number of flexures sustained before failure.

In regard to the latter conclusion, research shows if it is considered necessary or desirable to use gage copper for certain joint installations, it is only necessary to increase the height of the leg to insure adequate resistance to failure by flexure.

Paint Resists Battery Acids

Long a problem to those using acid type storage batteries has been the problem of steel battery tray corrosion.

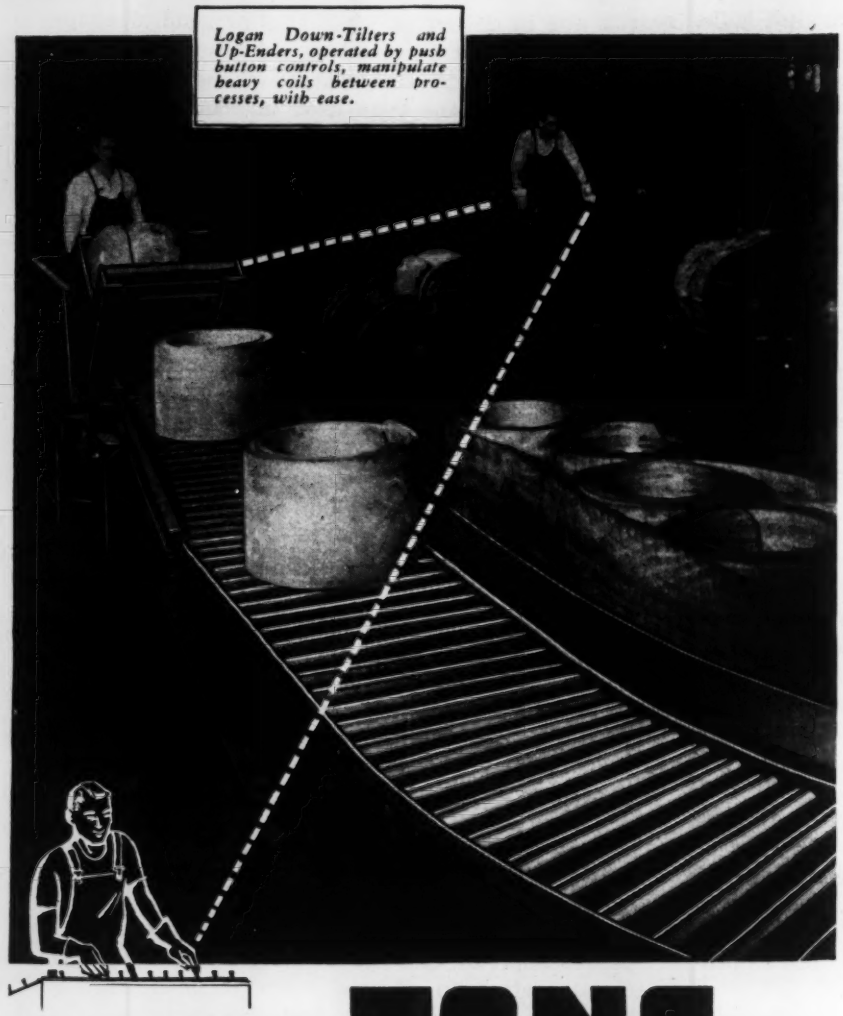
Sheet steel was used for these trays because it has proved superior to wood in many instances. Reasons: Greater strength of steel trays is important; with less bulk in steel, larger batteries could be used in the same space; greater strength eliminated need for special compartments to house battery installations in electric vehicles; steel trays were a step towards standardization of space allotted to batteries. But to capitalize on these advantages, it was necessary to find a corrosion resistant coating for the sheet steel.

To capitalize on the advantages, development of a new corrosion proof process to protect aluminum alloy battery compartments in military aircraft was begun by Electric Storage Battery Co. engineers some time ago. Process ultimately developed by the Philadelphia company not only used a new type of corrosion resistant coating, but also a new application technique. Once proved successful in sealing aluminum alloy against the acid action, experiments were tried on sheet steel and the result was similar.

The new coating is also claimed to limit corrosion to the bare steel, should the surface be exposed. This is due to the tight bond formed between coating and metal surface.

Nonindexing Threading Machine

No indexing is required in generating threads on the Cornelis machine of Belgium manufacture, now available from George Scherr Co. Inc., New York. All starts of the thread are developed at the same time, eliminating the usual difficulties in spacing inaccuracies.



Logan Down-Tilters and Up-Enders, operated by push button controls, manipulate heavy coils between processes, with ease.

TILT TONS *with* FINGERTIPS

It's the American way. *Devising machinery to take the burden off the backs of men* . . . means more efficient operation . . . and is a basic principle in the industrial growth of the nation.

Nowhere is the above better exemplified than in moving materials via Logan Conveyors in steel and brass mills. Coils and other heavy products, move easily through processing and to shipping with no manual handling except the human touch at electric controls.

Logan Co. is proud of its pioneering role in serving the steel and metal working fields for two generations. If you have a handling problem write for literature or for an engineer to call.

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

Seek Suitable Mold Coating

Tar is the most popular coating for open-hearth molds though main objection to its use is the obnoxious fumes given off. This was one of the important phases of open-hearth practice discussed at the annual off-the-record meeting of the open-hearth section of the American Institute of Mining and Metallurgical Engineers, Pittsburgh, Nov. 3.

Tar fumes are considered health hazards and labor has objected to the dangers to the extent that many shops now are experimenting with other materials in an attempt to find suitable substitute.

Charactertistics of good mold coatings include low volatile content, high-flash point (if any), extremely low-moisture content when dry on mold, fast drying, ability to evolve reducing or neutral gases during pour, and noninjurious to worker.

More than a "Skin"—A mold coat affords better ingot surface, improved ingot structure, improved mold life and eliminates subsurface porosity according to plate, forging, bar and sheet manufacturers.

Mold design, grade of steel, rate of fill, type of oxidation, grain size, finished product, conditioning cost, cost of coating, fumes and application or facility limitations must be given proper consideration in selecting a coating material.

Various coatings are being experimented with, such as powdered pitch, Darmold, Hydropaste, Mex-Kote, Black Mold Kote, Ingot Kote, sugar powdered coal plus starch and others. Powdered pitch appears to have gained the most respect although some shops have discontinued its use and substituted some of the other above mentioned coatings.

Copper Alloy Production on Film

Would you like to take a trip through a modern copper alloy mill? This opportunity is presented to those viewing a new 16 mm industrial film "Quality Mill," which follows the production of phosphor bronze, nickel silver, cupro nickel and beryllium copper alloys from initial casting through to final inspection and shipping.

The latest in production equipment, including two 4-high mills, is shown in action. It is said that one of these mills rolls three times as much strip as any other mill in the plant, with the additional advantage that closer tolerances are held. Such actual production scenes as loading induction furnaces, reducing castings, annealing sheets, drawing wire and

A new TIMKEN® analysis for high temperature service

17-22A ALLOY STEEL

Gives you these 4 advantages

1. Unusual creep resistance
2. High resistance to thermal cracking
3. High resistance to heat checking
4. Resists hot upsetting under rapidly applied stress at extreme temperatures

17-22A alloy steel was originally developed by Timken® for use in mechanical connections operating at temperatures up to and including 1000°F. However, the resistance of 17-22A steel to creep, thermal cracking and heat checking has permitted its use in many types of hot die applications. It is also capable of giving very satisfactory service in other high temperature applications such as flanges, fittings and miscellaneous forgings.

An outstanding example of the versatility of 17-22A can be found in the brake discs of large, high-speed aircraft where temperatures of 1700° F. are often encountered. Even under these extreme conditions, 17-22A steel resists both heat cracking and hot upsetting.

For complete information on 17-22A and other Timken bolting steels, write for Technical Bulletin Number 36. And for help in your high temperature steel problem, call on our Technical Staff. There's no obligation. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

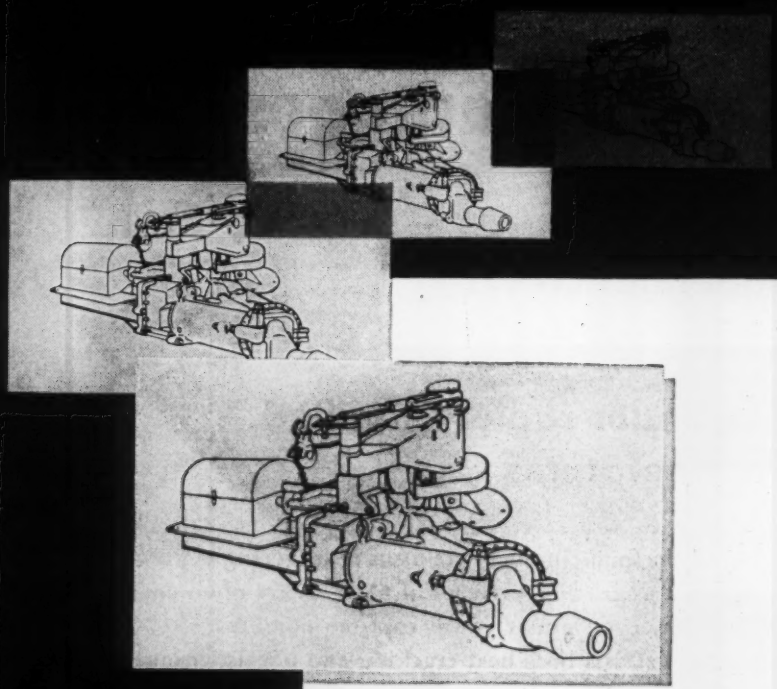
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

Remember to specify

BROSIUS

for ruggedly built
more efficient Clay Guns



* Here are two very good reasons why Brosius Clay Guns are so highly practical to operate and maintain. First, they are backed by many years of specific blast furnace engineering skill and experience; and second, each gun is individually designed, machined, assembled, inspected, and tested at the Brosius factory. For more information and literature on sturdy low-cost electric-mechanical, electric-hydraulic or steam guns, simply write to us.

Edgar E. BROSIUS Company Inc.
SHARPSBURG • PITTSBURGH 15, PA.

slitting coils are shown, along with testing, inspection, and control operations.

You can obtain this motion picture for showing by writing to Riverside Metal Co., Riverside, N. J., in whose plant it was produced.

Aluminum Structural Design

Any engineer familiar with mechanics of materials is able to design an original structure of aluminum, or to convert an existing structural design from some other material to aluminum by using the *Aluminum Structural Design Handbook,* issued by Reynolds Metals Co., Louisville.

Discussion in the 1950 edition is broken down into chapters on figuring tensile stresses, compressive stresses, bending and shear stresses, as well as stresses in cylinders subjected to fluid pressure. Formulas and actual examples are also included.

Section is devoted to fabricating considerations and joining methods, including riveting, bolting, fusion and spot welding.

Other chapters cover deflection and vibration problems. There are 66 pages of tables presenting information on physical, chemical and mechanical properties as well as a list of sizes, alloys and temperatures of aluminum products and many formulas.

Supervisional Safety Psychology

Psychology of safety in supervision is the subject of six new training booklets for foremen and supervisors, issued by National Safety Council, Chicago. Written by Dr. J. L. Rosenstein, industrial psychologist and professor in the department of management, Loyola University, Chicago, the series includes books on the following subjects:

You Can't Change Human Nature, What Is Your U Q?, Teaching Safety On the Job, People Act Alike, Safety Takes Teamwork, and You Are Human Too. Council is located at 425 N. Michigan Ave., Chicago 11, Ill.

Operates at Low Temperatures

Maintaining efficient operation at temperatures as low as 5° below zero is a linear type electromechanical actuator designed for operation of carburetor preheat valves, trim tabs, turbo selectors, ground oil coolers, etc.

Perfected by the Hydro Air Corp., Burbank, Calif., the new actuator features operating time of 8

seconds in either direction, and integral brake which stops over travel under full load within 0.02-inch after power has been shut off, nonjamming stops and adjustable load limit switches and a squirrel cage induction motor of 115 v ac, single phase 400 cycle type.

Streamlines Internal Connection

In every pipe there is a certain amount of skin friction that sets up little eddies in the fluid passing through the pipe. At the joint, this friction is increased as the fluid pushes into the recess between flanges. But with a high-pressure gasket developed by Flexitallic Gasket Co., Camden, N. J., the joint is streamlined, this said to result in reduced turbulence in the piping and increased flow of fluid.

The style CGI gasket is of the compression gage type with both an inside and outside ring. It has a spiral-wound construction with alternating V-crimped plies of metal and filler, The steel ring is said to practically fill the flange recess so that no turbulent barrier is set up. Gasket is made for almost all ASA and API fittings as well as for special designs. Pressure range is 150 to 2500 pounds. It is offered in stainless, Monel, nickel and Inconel and other metals.

Aids Selective Hardening

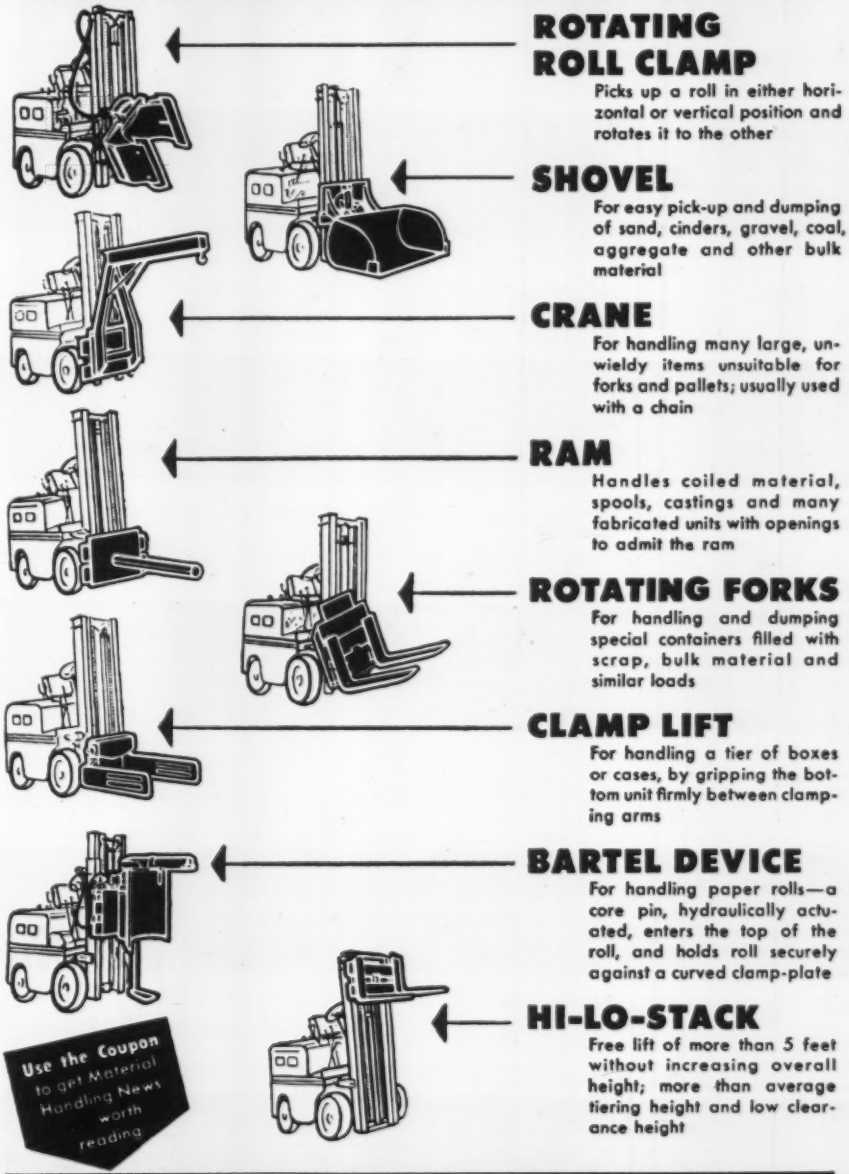
Usable with any conventional hardening process is an isloating paste for keeping desired sections soft while the rest of the workpiece is case hardened. Called Isopac and offered by Denfis Chemical Laboratories Inc., Brooklyn, N. Y., the material is a heavy paste which is said to be easily applied before starting the hardening process and easily knocked off after quenching. The company claims that it will neither crack nor shrink.

Lubrication Where Wanted

Either grease or oil may be sprayed onto open gearing slide surfaces or any other area where it is desirable to apply a measured amount of lubricant at regular intervals by a recently announced spray valve. A development of Farval Corp. of Cleveland, the valve can be operated wherever compressed air is available, either as an addition to the company's Dualine lubrication system or in a complete system of spray valves, served by either a manual or an automatic pumping unit.

Compressed air for the supply line

CLARK Attachments MAKE THE CLARK FORK TRUCK "MANY MACHINES IN ONE"



ROTATING ROLL CLAMP
Picks up a roll in either horizontal or vertical position and rotates it to the other

SHOVEL
For easy pick-up and dumping of sand, cinders, gravel, coal, aggregate and other bulk material

CRANE
For handling many large, unwieldy items unsuitable for forks and pallets; usually used with a chain

RAM
Handles coiled material, spools, castings and many fabricated units with openings to admit the ram

ROTATING FORKS
For handling and dumping special containers filled with scrap, bulk material and similar loads

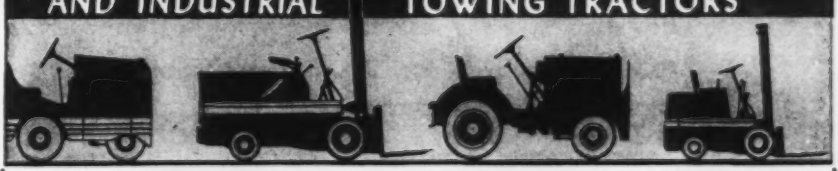
CLAMP LIFT
For handling a tier of boxes or cases, by gripping the bottom unit firmly between clamping arms

BARTEL DEVICE
For handling paper rolls—a core pin, hydraulically actuated, enters the top of the roll, and holds roll securely against a curved clamp-plate

HI-LO-STACK
Free lift of more than 5 feet without increasing overall height; more than average tiering height and low clearance height

Use the Coupon to get Material Handling News worth reading

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS



INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 26, MICH.
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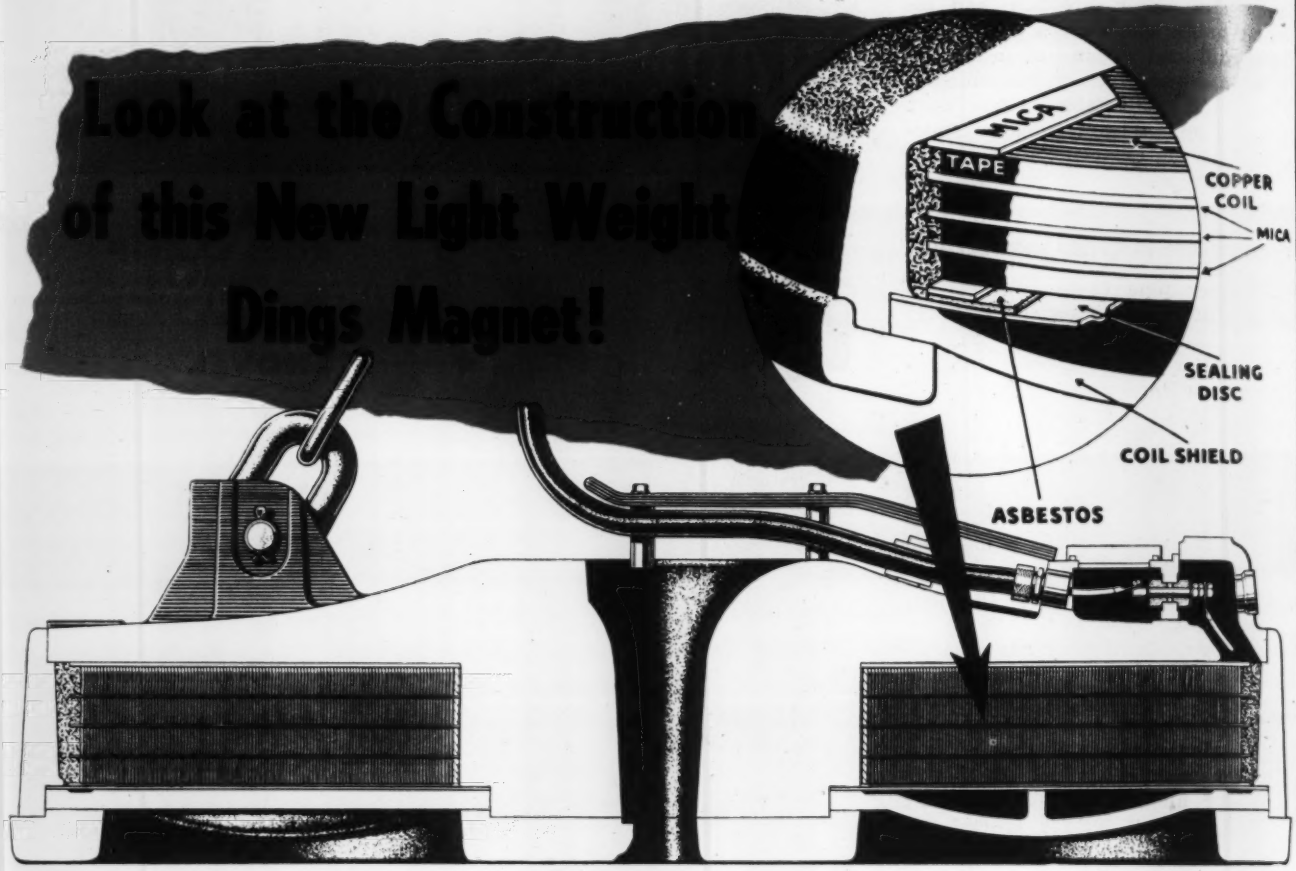
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

Look at the Construction of this New Light Weight Dings Magnet!



IT'S all welded — with a scientifically correct magnetic circuit that allows lighter weight with greater lifting power! And no sacrifice in strength or durability — in fact it has many features to help it better withstand rough and continuous use. Because of this it offers you:

LIFTING ABILITY that *lasts* . . . and *lasts*

Here are the features:

1. WELDED CONSTRUCTION.
2. LIGHT WEIGHT.
3. Tamper-proof, sealed terminal box.
4. Four-point chain suspension. (only Dings has it)
5. Protector guards for the magnet cable. (another Dings exclusive)
6. Scientifically balanced magnetic circuit that eliminates flux bottlenecks and puts maximum power into the lift.

DINGS MAGNETIC SEPARATOR COMPANY
4710 W. Electric Ave., Milwaukee 46, Wis.

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Number B1401-A just off the press — gives detailed information on capacities, ratings, dimensions. WRITE TODAY.

The Gauss strength of every Dings Magnet is measured and certified equal to or greater than the minimum guaranteed. None leaves the factory that fails to meet Dings high standards!

is directed through the spray valve which meters air to the delivery nozzle. Lubricant valve also turns on and shuts off the air; thus the quantity of air used is limited to the amount needed to spray each delivery of oil or grease without exhausting or reducing pressure.

Heat Treatment Circular

Presenting basic theoretical and practical principles involved in the heat treatment of ferrous materials is a recently released circular offered by National Bureau of Standards. Available from the Government Printing Office, Washington 25, D. C. for 25 cents, and identified as circular 495, it discusses the effects the various treatments on the structural and mechanical properties of iron and steel. It might be noted that many theoretical aspects and technical details have been omitted for the sake of simplicity.

Subjects presented include properties of iron, alloys of iron and carbon, decomposition of austenite, heat treatment of steels, hardenability, heat treatment of cast iron, nomenclature of steels, recommended heat treatments and properties and uses of steels. A list of selected references is also given; graphs, tables and photographs are incorporated.

Recondition Your Work Gloves

One large user of work gloves is saving 80 per cent of all gloves sent in for salvage through a glove reconditioning service. Originated by U. S. Industrial Glove Corp., Detroit, the service, although new on a national basis, has been tested in various types of plants.

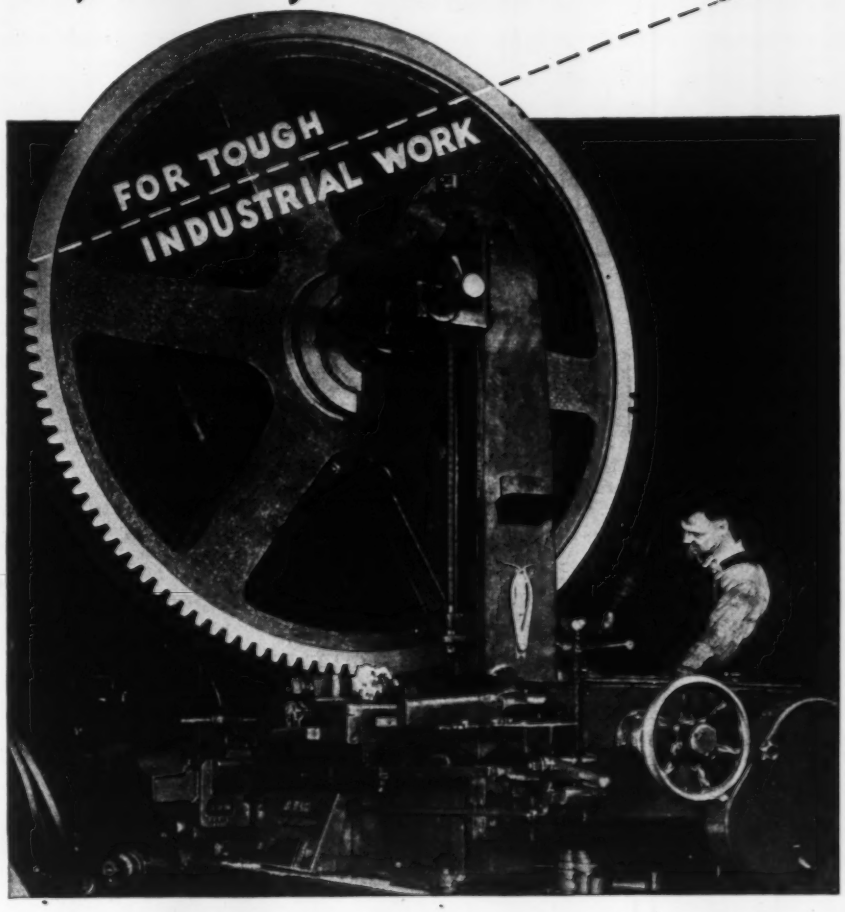
Service includes renovation, sanitizing and packaging of all types of worn out fabric and leather gloves and protective clothing. It is said that the results have proved that many gloves can be salvaged several times.

Stainless Machining Notebook

Carpenter Steel Co., Reading, Pa., is offering an all-inclusive notebook on the machining of stainless steels. According to the company, the purpose of the book is to make available information that will help users save money on machining, reduce rejects, overcome troubles and iron some of the kinks out of machining practice.

After a short introduction and classification of the types of stainless steels, sections are devoted to turning, drilling, tapping, threading, milling, broaching, reaming, filing and

SPUR GEARS
by Horsburgh & Scott



• This large gear, in the making, will soon be doing hard work in a steel mill . . . just one of many gears made by Horsburgh & Scott in sizes up to 12 feet in diameter and 20,000 pounds weight. There's a Horsburgh & Scott gear for every job . . . accurate . . . rugged . . . built to endure . . . a trial will prove their quality.

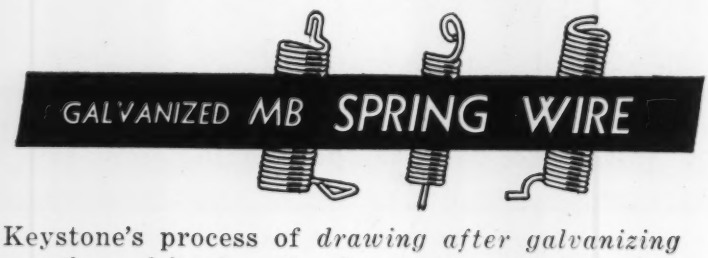
Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

Specialized Wire for Specialized Products

Keystone

This new wire developed by Keystone helps recessed head screw manufacturers to lower production costs. It delivers the desired forming and upsetting qualities uniformly. Because of excellent flow properties — die and plug life are often more than doubled — production records show fewer rejections and reduced inspection time. Keystone Cold Heading Wire is "special processed" for *tough* Cold Heading jobs.



Keystone's process of *drawing after galvanizing* smooths and hardens the zinc coating, increasing its lasting qualities and its physical properties. This shiny smooth finish, corrosion resistant Spring Wire is now available in Type 2 and Type 3 heavy weight zinc coating as well as the regular weight suitable for most applications.

If your product requires "special" steel wire, please consult us.

sawing, stoning and lubrication. Tables or drills for tapped holes, cutting speeds and decimal and metric equivalents are included, along with an itemized index. The machining notebook is available from the company for 50 cents.

•

Northwest Industrial Potential

Untapped areas of possible industrial and economic development are ably described in a 136-page book titled *Major Industrial Potential of Snohomish County,* by Ivan Block, nationally recognized industrial and economic authority on the Pacific Northwest.

The comprehensive survey includes 27 maps and charts of statistical material, 39 tables of specific information and 12 pages of photographs to tell the story of the county's raw materials, water and power supply, ports and transportation facilities, etc. Purpose of the survey is to analyze the major industrial potentials based on the county's abundant low-cost hydroelectric power, pure water and easy access to the ocean-borne commerce.

An important feature of the survey is the analysis of possible electro-process industries including aluminum, titanium, pig iron, stainless steel, electrolytic iron and manganese, and nonferrous metals. Western states producers of various chemicals important to industrial development and whose product can be shipped by rail or water into the county are shown by product, company and location by map.

Demountable Cushion-Style Tires

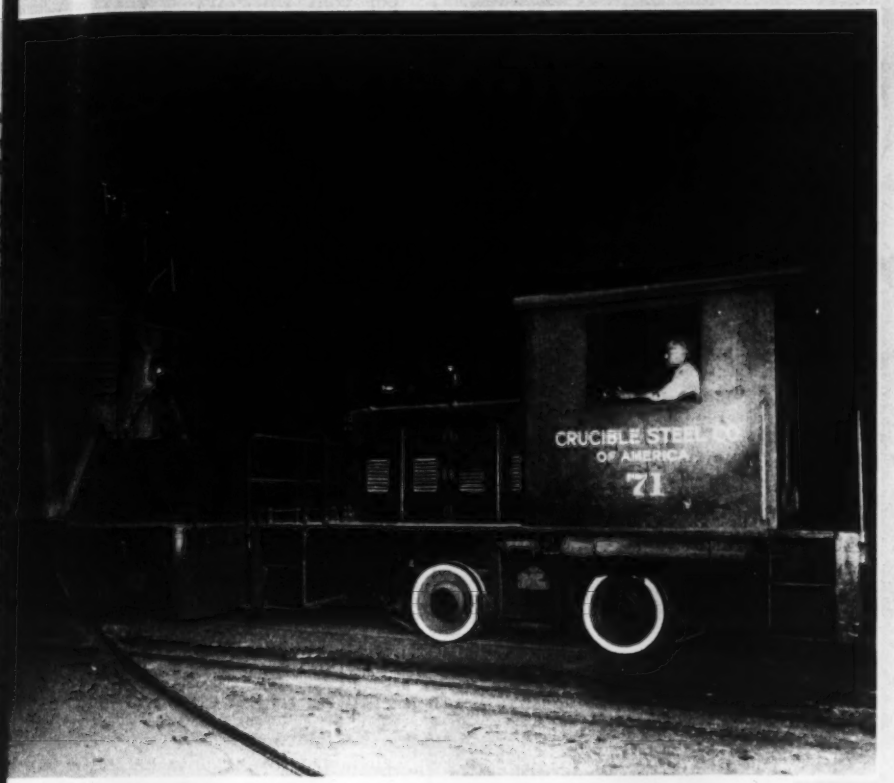
To be standard equipment on two fork-truck models and one towing-tractor is a demountable cushion-style rubber tire, states Clark Equipment Co.'s Industrial Truck Division, Battle Creek, Mich. Said to require less time to mount than a passenger car tire, it is offered on the company's gas Trucloader fork-lift truck in both the 1015 and 1024 models, on the electric battery-powered Trucloader 1024 model, and on the Clarkette-5 towing tractor.

Lengthens Tool Holder Life

After turning the equivalent of 22 miles of chips, a new type of chrome-plated ejector tool holder showed no sign of erosion and appeared as good as new. On the job calling for 6-inch diameter shafts of high carbon alloy steel to be turned down to 5¼ inches at a surface speed of 400 rpm, these results were obtained.

Made by Super Tool Co. of De-

WHITCOMB *Hydro Motive*



Whitcomb 25-Ton Diesel Hydro-Motive Locomotive handles a train of hot metal ladles at the open hearth of Crucible Steel Company of America.

MEANS . . .

- **LOWER MAINTENANCE COSTS**
- **LONGER LOCOMOTIVE LIFE**
- **EASIER OPERATION**
- **SMOOTHER HANDLING**

MOVES MORE MATERIALS, LONGER, FOR LESS

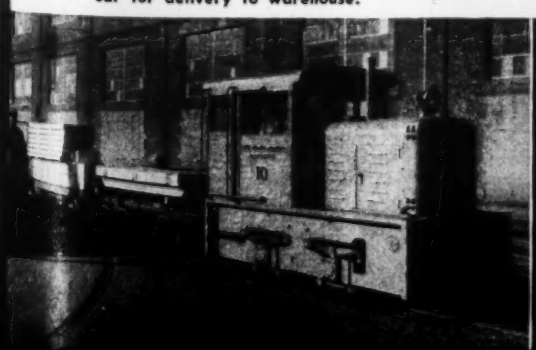
The Whitcomb Hydro-Motives give you greater value *every* way. You get the smooth-flowing power of an electric drive at far less cost with a Whitcomb Hydro-Motive. And maintenance costs are lower, too, because wearing, jarring road bed shocks are *not* transmitted to the engine. Instead the jolts are absorbed in the fluid coupling of Whitcomb's Hydro-Motive. Thus, locomotive wear is cut down, locomotive life lengthened.

But economy is only one advantage of the Whitcomb Hydro-Motives. They reduce operator-fatigue, reduce accident risks, because there is no lunging, no shifting — power is smooth, instant, uniform at any speed.

And the Hydro-Motive locomotive is every inch a Whitcomb — which means the finest in engineering, in materials, in workmanship. Replace your present outdated locomotives with smooth, new Whitcomb Hydro-Motives.

Write today for complete information on Whitcomb Hydro-Motive Locomotives, in sizes from 10 to 40 tons.

At eastern copper plant an 8-ton Diesel picks up loaded car for delivery to warehouse.



Whitcomb 20-ton Diesel mechanical locomotive of a type widely and profitably used in steel-making.

There is no power more economical than Diesel; no Diesel locomotive finer than a Whitcomb.

THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

SHARONSTEEL

"NO TRICK TO IT, IF YOU USE BRAINARD STEEL TUBING"!

These India lads would probably never use steel tubing to perform their famous trick, but if they did they wouldn't be able to find a better tubing than Brainard high quality welded mechanical steel tubing.

As manufacturers who now use Brainard tubing know, they need no tricks to bend, form, swage or otherwise fabricate—for Brainard tubing is quality controlled from ore to product to assure a more uniform, easier-working tube at lower costs.

Next time you need tubing or fabricated tube parts check with the Brainard office nearest you.

QUALITY CONTROLLED FROM ORE TO PRODUCT BY BRAINARD

Straight or Fabricated

SIZES: ½" to 4"—.025 to .165

TUBING DIVISION

BRAINARD STEEL COMPANY

23112 LARCHMONT AVENUE WARREN, OHIO

There are Brainard sales offices in Atlanta, New York, Cincinnati, Pittsburgh, Buffalo, Chicago, Philadelphia, Detroit, Cleveland, Indianapolis and Nashua, N. H. Sales Representatives: Sharonsteel Products Co. in Detroit, Grand Rapids, Mich.; and Farrell, Pa. Fred J. Reynolds, Davenport, Ia; Brass & Copper Sales Co., St. Louis, Mo.

troit, the holders have the chromium plating applied on the wear area. The company reports that on another job an interrupted cut on the flange of a cast iron housing showed a reduction in tool cost of about 70 per cent when the new type holder was used.

Dust Separated for Refiring

Refiring into boiler furnaces of high carbon particles without causing recirculating of all of the fly ash through the boiler, dust collector and induced draft fan is possible with the tubular dust collector marketed by Prat-Daniel Corp. East Port Chester, Conn.

Separation of the high carbon particles from the fly ash of low carbon content is accomplished within a single unit and with one pass of the gases. Larger particles suitable for refiring are deposited into one of two hoppers while the low carbon particles arrive in a separate system for disposal. Known as the Decantation, the method is said not to increase the normal resistance through the dust collector unit.

Smaller Capacity Shakeout

Extended to include smaller general purpose units with capacities from 2000 to 5000 pounds is the line of Foundromatic two-bearing shakeouts made by Allis-Chalmers Mfg. Co., Milwaukee, Wis. New unit is said to have a simplified mechanism which can be easily removed from the shakeout body.

The drive shaft extends on one side, requiring one dust seal. Sheave is eccentrically bored to compensate for amplitude of vibration so that operating amplitudes are not transmitted to the motor. Smaller units can be installed with deck horizontal or sloped for discharging duty. Portable bases are available so that the complete unit may be moved around the foundry.

One-Man Bridge Ramp

Awarded to Harry Diamond, president of Elizabeth Iron Works Inc., located at Elizabeth, N. J., was patent No. 2521349 on a one-man bridge ramp designed for use with fork lift trucks on railroad sidings. It is said to have a capacity of 15,000 pounds and can be placed and secured by the truck operator alone in less than 2 minutes.

Transported to location on the forks of any standard fork lift truck, the ramp is set in place and the forks withdrawn. Lift handles drop into place, providing a flush riding sur-

face. Locking pins fixed in floating arms secure the ramp in place. They are built to span gaps from 5 to 58 inches with height differentials of 7 inches. Riding surface is nonslip steel plate.

Tractor Moves, Spots Trailers

Transmission, steering, fifth-wheel, elevator and winch are all hydraulically operated on an all-purpose tractor developed to move and spot trailers. Designed and built by Columbia Truck & Equipment Sales Inc., New York, the tractor has eight speeds forward and reverse and is said to be capable of negotiating an 8 per cent grade with a 28,000-pound gross vehicle weight at 6.7 mph. Top speed is 10½ miles per hour.

The vehicle's tractive force and drawbar pull can haul 15 vehicles of 20 tons gross weight each on level ground. The operator stands on a low platform in front of a bank of finger-touch controls.

Synthetic Finish Fast Drying

Developed for use on trim and hardware made of iron, copper, gold, cadmium, chromium, nickel and brass is a clear, fast-drying plastic synthetic finish. Designated as Base VC-38 and made by United Lacquer Mfg. Corp., Linden, N. J., it may be tinted to give a gold or brass appearance to steel or aluminum.

Finish is reported to air dry sufficiently to handle in about 30 minutes and will air dry hard overnight. When baked for 10 minutes between 200 and 250° F it will dry hard. Field tests reportedly have shown that the finish gives metal items durability and resistance to perspiration, handling, marring and tarnish. Application may be by dip or spray process.

Control Features Rate Action

Introducing rate action into an electrically-operated control is a new system, the P.A.T. '50, announced by Leeds & Northrup Co. of Philadelphia. Rate action responds according to the speed with which the controlled variable changes and thus improves process output by reducing the length of time that an upset can force the controlled process off its set point.

If furnace temperature, for example, begins to fall, rate action immediately opens the fuel valve. The faster the drop in temperature, the wider the valve is opened, and as the rate of temperature departure decreases, rate action's effect also decreases, bringing the temperature back in line smoothly. Control also

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has proportional and reset control actions, and is applicable to the regulation of temperature, pH, chemical concentration and gas analysis. A new control unit electrically links a Micromax or Speedomax recording instrument and an electric valve drive mechanism. Existing installations may be converted to the new control unit.

Stand Facilitates Die Handling

Handling of heavy dies, molds, patterns and castings during hand finishing operations is facilitated by the Di-Ro stand, designed by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn. Of welded construction, 2 feet square and 30 inches high, the stand has a turntable on which heavy work can be rotated freely.

It is mounted on heavy duty thrust bearings fully protected from dirt and chips. Stand is said to be capable of handling work loads up to 3 tons. A quick-acting clamp locks the table in any position. A hinged arm, attached to one side of the stand, is provided to mount a Kellerflex flexible shaft machine, allowing it to swing in an arc of 180 degrees.

Modern Metal for Modern Uses

Outlining how "our most abundant metal" is produced and its various characteristics, is an illustrated booklet issued by Aluminum Association, 420 Lexington Ave., New York 17, N. Y. Detailing many of its uses, telling how it is made and what it is, the booklet is available from the association without charge.

Fire School Graduates 46

After three days of instruction in how to fight various types of fires, including small gas fires, sodium fires and pressurized petroleum fires, a class of 46 "students" graduated from Ansul Chemical Co.'s customer fire training school at Marinette, Wis. Many of the students were taught to fight fires peculiar to the industries they represented.

Lists Items, Methods, Aids

Over 25,000 items and many improved methods and aids for chemical analysis and testing are included in catalog No. 450, offered by Burrell Corp., Pittsburgh. Its cross-index system lists items by name and by functions.

A complete description of each item accompanies every listing. The survey was made by the company to determine which items, if any, should

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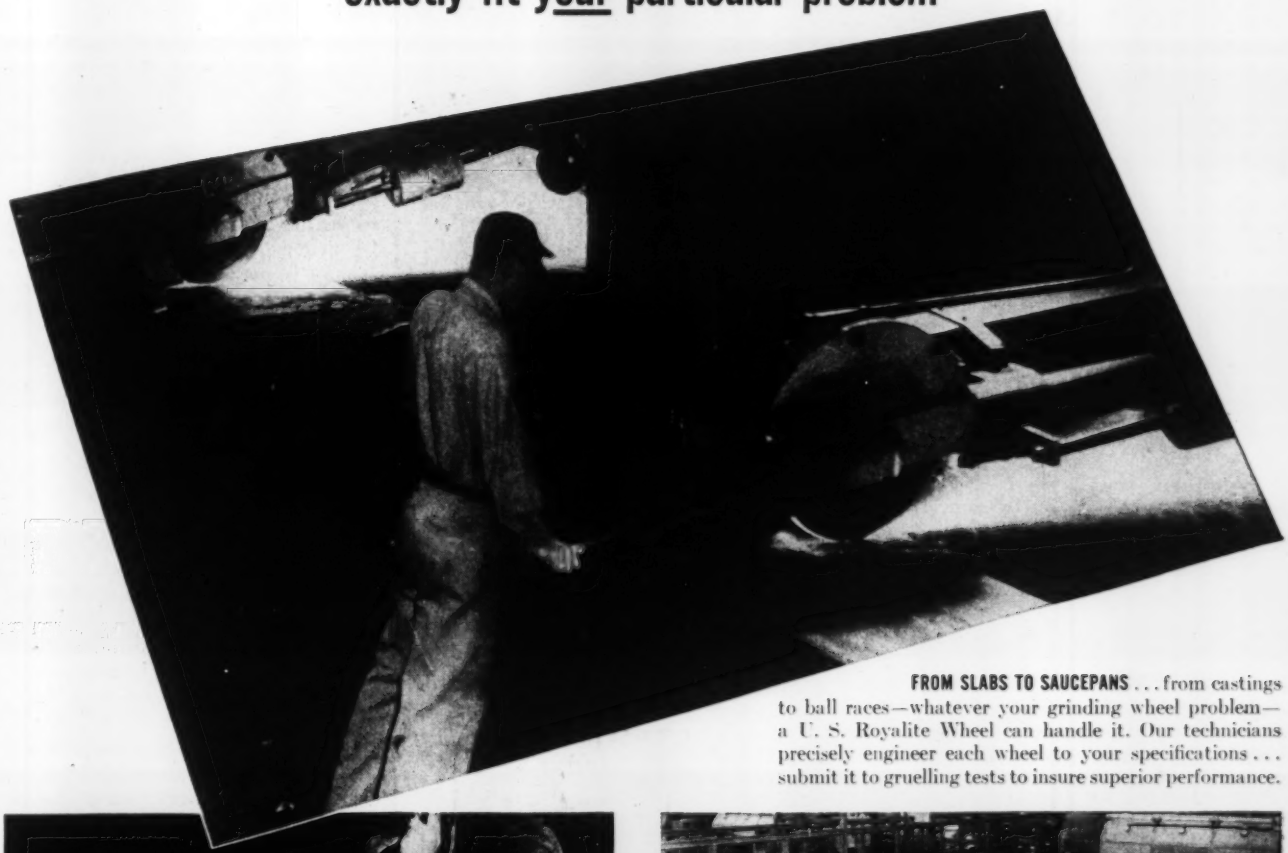

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Are you preparing to establish an employee suggestion system? If so, a recently published booklet will be of value to you in instituting such a program. Purpose of the booklet is to treat basic suggestion system with simplicity.

Where a large multiplant company probably would need a fulltime professional to start such a system, this publication is aimed at the smaller company in which the system is entirely internally handled. Booklet is available from Personnel Materials Co., 201 N. Wells St., Chicago 6, Ill.

Metal Widens Frequency Ranges

Consisting of a core of mild steel clad on each side with copper, the recently developed Electroshield metal is said to improve the performance of electronic communication equipment by shielding it from outside interferences. A product of American Cladmetals Co., Carnegie, Pa., the material is made in regular sheet sizes and gages. The company states that it has turned out the metal material in full size panels for shielded rooms in light and heavy sheet up to 35 square feet in area. It is said to be workable and readily weldable.

Holds Down Irregular Shapes

An unusual arrangement of toggles enables an irregularly-shaped load to be tightened down using a recently developed load binder. Licensed for manufacture by Institute of Inventive Research, San Antonio, Tex., the Russell binder will also tighten securely over rounded surfaces and is said not to slack when moved into a locked position.

It has been licensed to Texas Foundries Inc., Lufkin, Tex. Production prototypes are being manufactured. The binder is expected to go into assembly production at an early date.

Larger Centrifugal Castings

Recently added to the centrifugal casting department of American Non-Gran Bronze Co., Berwyn, Pa., is new equipment to produce larger sizes. The company can now produce centrifugally cast liners, sleeves, rolls, rings, bushings, etc., in rough and machined bronze alloys up to 12 inches OD and 13 inches long.

FRACTIONAL GRADES enable you to choose the exact degree of hardness desired by splitting every normal grade into three degrees of hardness, where a whole grade change would be too great.

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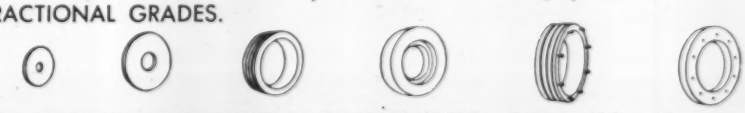

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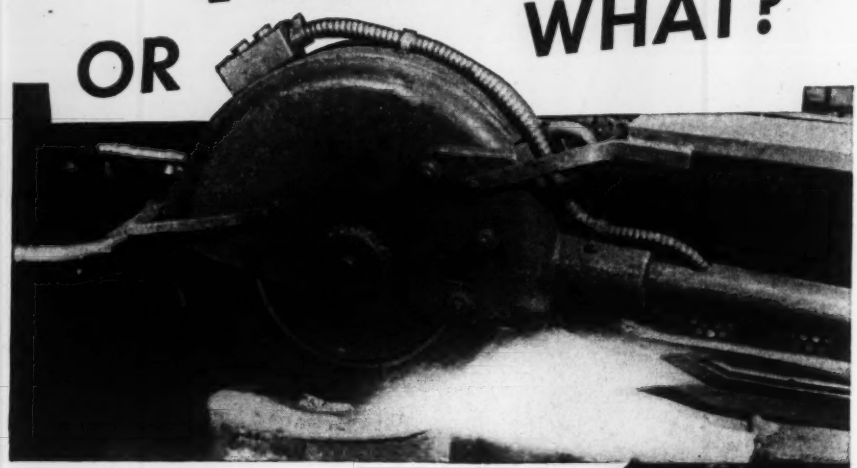

Every Electro Snagging Wheel is engineered to remove metal at lowest cost on some specific job. There's no such thing as an efficient, all-purpose, snagging wheel. Economy is not always in length of wheel life nor in cutting speed. An Electro Field Engineer at job-side can prove it to you.

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New Books

Canadian Directory

Canadian Trade Index, cloth, 1086 pages, 6¾ x 10¼ inches; published by Canadian Manufacturers Association, Toronto, Canada, for $7.50.

The 1950 directory lists all products manufactured in Canada and the names of companies making them. Canadian manufacturers having more than a local distribution for their products, irrespective of membership in the association, are listed, there being about 10,000 firms.

The index is divided into five parts: An alphabetical directory of manufacturers with addresses, branches, export representatives, trade marks and brands; manufacturers classified according to products made; directory of exporters of agricultural produce and allied lines; an export section giving details of Canadian government service and other export information; an alphabetical list in Spanish and Portuguese (both limited editions) of headings in the classified section with parallel English.

Use is made of different colored papers to distinguish between sections. Other information included is facts about the Canadian Manufacturers Association, its officers, departments, divisions, officials and publications, plus several advertising sections, broken down according to type of business performed.

Industrial Research

Theory and Practice of Industrial Research, by David Bendel Hertz, industrial consultant and assistant professor of industrial engineering, Columbia University; cloth, 385 pages, 6¼ x 9¼ inches; published by McGraw-Hill Book Co. Inc., New York for $5.50; available from STEEL, Penton Bldg., Cleveland 13, O.

Dealing with the process of research as it applies to industry, this volume covers the fundamental requirements of research operations and shows how the organization and structure which may be most profitably utilized follow from an analysis of the elements in the process. It starts with the theoretical background and analytical material on creative mentalities, problem solving, and scientific method, applying these concepts to industrial research.

It progresses from such general topics as the industrial background of research and the inception of research programs to an examination of cost and time elements, personnel selection and administration, facilities, patents, and internal and external relationships.

The author seeks to present the

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Perhaps not one of these identification tags describes the kind of steel wire that's best for your requirements. Although there are countless applications for the common types of wire, more and more specialty grades are being used today. These have been developed with specific end uses in mind. They have properties that help wire processors to cut production costs and to improve the performance and sales appeal of wire products.

Your own uses may call for one of our standard grades or a special-purpose type of steel wire. Either way, you can count on our paying strict attention to the important details in turning out a top-quality product in our modern wire mills.

In just the past few years we have made real strides forward in perfecting various specialties in steel wire. Perhaps you'd be interested in some of these. Our engineers will be glad to contribute their experience to any problems you may have in the selection and processing of steel wire.

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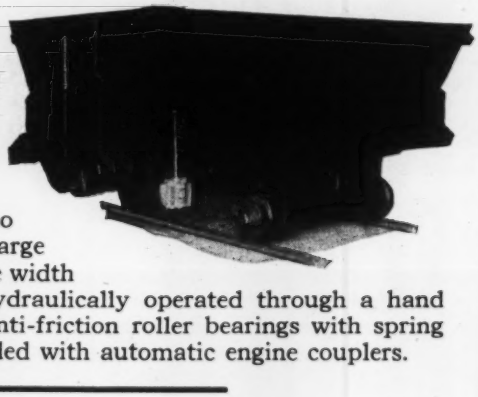
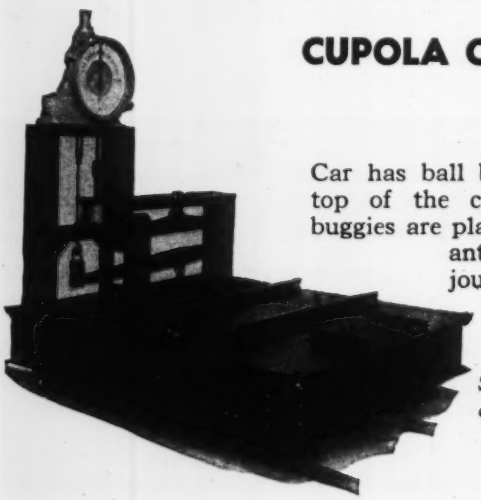


The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.

CUPOLA CHARGING SCALE CAR



Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

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essentials of the process of attaining this objective: The entire organizational pattern should be such as to reinforce the creative abilities of the personnel. It is also intended to assist management in arriving at a sound policy with regard to project selection and research administration. The first four chapters present theoretical background and analytical material on creative mentalities, problem solving, and scientific method. The remainder of the book applies these concepts to industrial research, proceeding from such general topics as the industrial background of research and geneses of the research program to specific areas of interest in the field.

Wisconsin Directory

Classified Directory of Wisconsin Manufacturers; paper, 800 pages, 6 x 9 inches; published by Wisconsin Manufacturers Association, Milwaukee.

This 1950-51 edition, tenth since publication was begun in 1921, contains many changes in data pertaining to individual companies. Publishers state that an attempt has been made to include at least the name of every industrial or allied enterprise in the state. Companies are listed alphabetically and geographically, as well as according to products and brand names.

The geographical section lists names of cities where plants are located, cities being arranged alphabetically. Under each company are listed certain officers, number of employees, products made and brand names used. Only company and location are listed in the products indexes and brand index.

High Temperature Properties

Metals at High Temperatures, by Francis H. Clark, consulting metallurgist; cloth, 372 pages, 6¼ x 9¼ inches; published by Reinhold Publishing Corp., New York, for $7; available from STEEL, Penton Bldg., Cleveland 13, O.

Designed primarily to cover heat resistant alloys and special alloy steels, this book also includes other metals such as aluminum, lead and magnesium alloys in the compilation of the most recent available data on the properties of metals at elevated temperatures. Text is introduced by a theoretical discussion on plasticity of metals, with special reference to high temperature effects.

Intended for those concerned with engineering and metallurgical aspects of high temperature service, particularly in reference to turbojet airplane engines where these alloys are playing a critical part, the book contains

many essential tabular data giving properties of all the latest alloys which have been developed. Considerable space is devoted to the phenomenon of creep in metals and alloys. There is also a section on test methods for metals of high temperature and current manufacturing methods for heat resistant alloys.

Screw Production

Schraubenherstellung (*The Production of Screws*); 244 pages, 6¼ x 9 inches; published by Stahleisen, Dusseldorf, Germany.

This book deals with the production of bolts and nuts, the first 26 pages being devoted to the history of making these fasteners. Stresses in them are discussed in 40 pages, while testing of raw material and of finished bolts takes up 18 pages. The 70-page fourth chapter on the manufacturing processes is subdivided into production and composition of steel, warm-heading and cold-heading, minor processes, threading by chip-removal and plastic deformation, heat treating, and finally production of nuts.

Ensuing chapters are devoted to apparatus and machinery, standards for materials and finished bolts, patents and an extensive bibliography. Although a creditable piece of work, the author's theory on stresses in bolts and nuts is incomplete and not entirely correct. It contains a large amount of useful information and should be of value to those learning the screw and bolt business.

Strength of Materials

Statics and Strength of Materials, by Jasper O. Draffin and W. Leighton Collins, professors of theoretical and applied mechanics, University of Illinois; cloth, 398 pages, 6¼ x 9¼ inches; published by Ronald Press Co., New York, for $6.50; available from STEEL, Penton Bldg., Cleveland 13, O.

Methods of presentation make much use of free-body diagrams and emphasize the geometric interpretation and physical visualization of the problem rather than the purely mathematical consideration. Book is useable and understandable by students in technical and architectural courses who do not expect to pursue a rigorous engineering curriculum of 4 or 5 years, and who consequently do not carry their mathematics beyond college algebra and trigonometry. The combination of the two subjects in one volume results from these needs and purposes.

In statics, coplanar force systems are treated in detail by the algebraic method, and a chapter is devoted to explanation of force systems in space. Strength of materials portion covers

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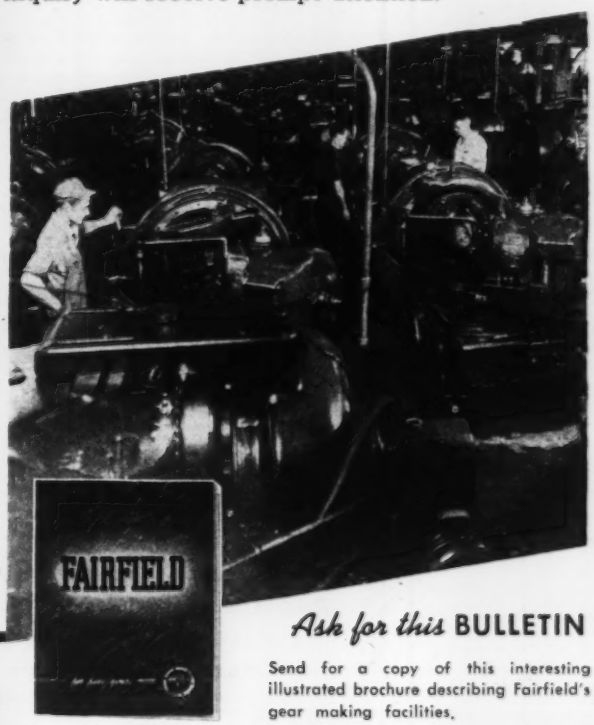

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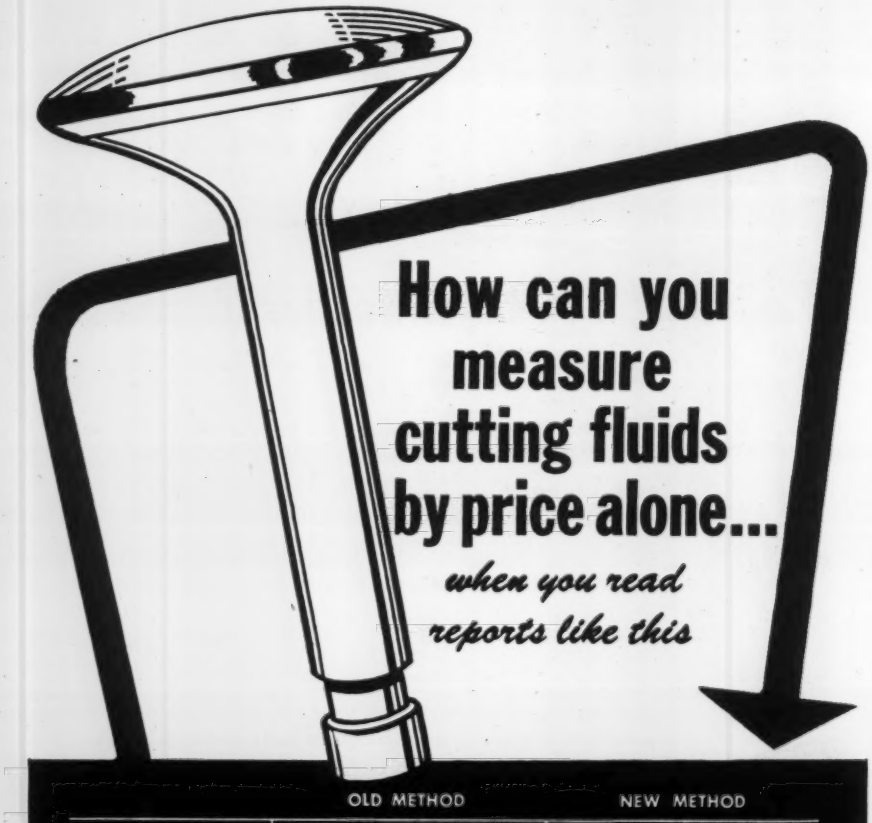

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Grinding Fluid	Soluble Oil		SuperKool 81X Grinding Oil	
Material and Hardness	Steel Forgings Rc 30-36		SuperKool 81X Grinding Oil	
Stock Removal	VALVE STEM Finish Grind .004"-.006" in 2 passes	VALVE FACE Rough Gr. .006"-.008" Finish Gr. .004"-.006" in 2 passes	VALVE STEM Finish Grind .004"-.006" in 1 pass	VALVE FACE Rough and Finish Grind in 1 pass .014"
Average Production per Wheel Dressing	350-400pcs.	300-350pcs.	2000pcs.	1200pcs.
Total Life of Wheels	Maximum of One Week		Eight Weeks	
Grinding Fluid Cost on Machine	About $.02 per gallon		$.66 per gallon*	

*This figure does not take into consideration the reclaiming of straight oils which usually reduce the cost at least 80%.

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simple structural elements involving direct stress, including welded connections, torsion bending, and column action. Data are presented for the more modern materials, such as lightweight alloys, high-strength steel, and plastics in a chapter on mechanical properties of materials and working stresses. A large number of problems are provided which have been selected from the broad fields of structures and machines. These problems range from the simple to the complex.

Stress Analysis

Handbook of Experimental Stress Analysis, edited by M. Hetenyi, professor of engineering mechanics, Technological Institute, Northwestern University; 1077 pages, fabrikoid, 6¼ x 9¼ inches; published by John Wiley & Sons Inc., New York, for $15; available from STEEL, Penton Bldg., Cleveland 13, O.

In the 18 chapters and three apendices of this book, 31 contributors, all authorities in the field, have presented a definitive work on the subject. They have gathered all the existing experimental methods, heretofore scattered and incomplete, for the determination of mechanical strength. Stress analysis, often regarded as the distinct professional branch of engineering, has as its object the determination and improvement of mechanical strength of structures and machine.

Experimental stress analysis strives to achieve these aims by experimental means. The editor, knowing the inadequacy of published material on the subject, realized at the same time that no one person could possibly write with authority on all the major experimental procedures being used at present.

Extremely well illustrated and equipped with a detailed index, the book covers all of the better known experimental methods and equipment in use today. In addition, the three appendices cover the subjects of fundamentals of the theory of elasticity, dimensional analysis and the precision of instruments.

Michigan Directory

Directory of Michigan Manufacturers 1950-51; leatherette, 361 pages in three sections, 8¾ x 11¼ inches; published by Manufacturer Publishing Co., Detroit, Mich., for $22.

Published in a state that has seen 5000 new manufacturing plants evolve in the last four years, this directory is divided into three sections, each with different colored pages. The first or master geographical section accommodates listings of all of Michigan's 12,000 manufacturing opera-

tions, including firm names, addresses, names, initials and titles of all major executives from purchasing agents to presidents, along with type of management, products manufactured, number of employees, whether they be male or female, year established and export information.

The alphabetical section lists manufacturers from A to Z with post office address. In using this section, the user refers to the master geographical section for complete listings, as he does after using the third, or product, section which classifies manufactured products under more than 2300 headings.

CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

Dec. 4-6, Electric Industrial Truck Association: Meeting, Hotel McAlpin, New York. EITA is located at 3701 N. Broad St., Philadelphia.

Dec. 5, National Welding Supply Association: Southeastern zone meeting, Hotel Patten, Chattanooga, Tenn. (Note next meeting)

†**Dec. 7 Material Handling Institute Inc.:** Annual meeting, Hotel New Yorker, New York. Headquarters: 1108 Clark Building, Pittsburgh 22.

Dec. 7 National Welding Supply Association: Southeastern zone meeting Hotel Texas, Fort Worth, Tex. Address of association is 505 Arch St., Philadelphia 6.

Dec. 7-9, Electric Furnace Steel Committee, AIME: 8th annual meeting, William Penn Hotel, Pittsburgh. AIME headquarters: 29 W. 39th St., New York 18.

Dec. 11-12, American Management Association: National Production Conference, Hotel Drake, Chicago. Association address is 330 W. 42nd St., New York 18.

†**Dec. 12, National Association of Engineering Companies:** National industry mobilization meeting, Detroit-Leland Hotel, Detroit, Mich. NAEC address is 1601 Dime Bldg., Detroit 26.

Dec. 13-14, Power Crane and Shovel Association: Meeting, Edgewater Beach Hotel, Chicago. Association address is 74 Trinity Place, New York 6.

Dec. 14, Cutting Tool Manufacturers Association: Meeting, Recess Club, Detroit. 416 Penobscot Bldg., Detroit 26, is association address.

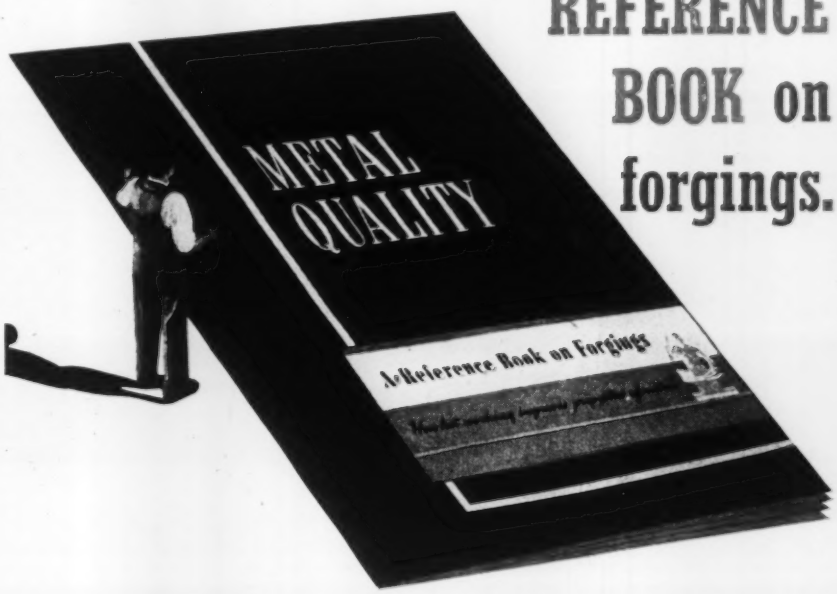
Dec. 14-15, Society of the Plastics Industry: Second conference of plastics film, sheeting and coated fabrics division, Commodore Hotel, New York. Society is located at 295 Madison Ave., New York 17.

†**Jan. 10-12, 1951, Southern Supply & Machinery Distributors' Association:** Mid-year meeting, Edgewater Gulf Hotel, Biloxi, Miss. Association is located at 208 Peachtree arcade, Atlanta, Ga.

†**Jan. 14-16, Institute of Scrap Iron and Steel:** Annual convention and exhibit of equipment manufacturers and suppliers. Location of institute is 1346 Connecticut Ave. N. W., Washington 6, D. C.

†**Jan. 15-16, Industrial Furnace Manufacturers Association:** Mid-year meeting, Edgewater Beach Hotel, Chicago. Address of association is 420 Lexington Ave., New York 17.

What *Forgings* have that offer so many more economic, engineering and production advantages than can be obtained with any other material, is illustrated and described in this REFERENCE BOOK on forgings.



Write for a copy. Then consult a forging engineer about how you can obtain the correct combination of mechanical qualities in forgings for your particular type of equipment.

DROP FORGING ASSOCIATION
605 HANNA BUILDING
CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality—How Hot Working Improves Properties of Metal", 1949 Edition.

Name .....

Position .....

Company .....

Address .....

News about steel

FROM U·S STEEL SUPPLY

What effect will "Mobilization Economy" have on steel supplies?

● Our economy is now entering an extended period unlike any other in our history. During this period, industrial efforts will be divided between building an adequate defense machine and maintaining our high standard of living. Industries working on government defense orders will have "DO" priority ratings and get first call on critical steels. Steel distributors will replenish their inventories by passing these defense orders along to steel producers.

Under these circumstances, if you do not have a "DO" priority rating you may have difficulty obtaining certain steel items essential to defense. Substitute steels can frequently be employed, but you may need help in locating suitable material.

Here's how to get the help you need: Call in a United States Steel Supply Company representative. He will do his best to locate the type of steel your work requires. That's his job . . . to give the best *service* possible, whatever the circumstances.

Principal Products: Carbon, Alloy and Stainless Quality Steels Aluminum · Reinforcing Bars · Tools · Supplies and Machinery

WHEN YOU DEAL WITH US, YOU GET Service Plus!

UNITED STATES STEEL SUPPLY COMPANY

Warehouses and Sales Offices: BALTIMORE · BOSTON · CHICAGO
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Sales Offices: INDIANAPOLIS · KANSAS CITY, MO. · PHILADELPHIA · ROCKFORD, ILL. · TOLEDO
TULSA · YOUNGSTOWN
Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

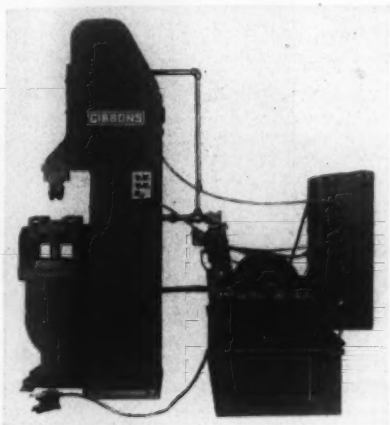
UNITED STATES STEEL

New Products and Equipment

Press Bends Tubing Rapidly

Operating at a speed of 20 strokes per minute, the series 200 hydraulic press for tube bending operations, announced by Gibbons Machine Co., Tipp City, O., has a multiple positive index stop for various degree bends. Knee width of the press is 11-inches, permitting reverse bends 5½ inches apart.

Rocker die and three sets of rockers and side arms are furnished with

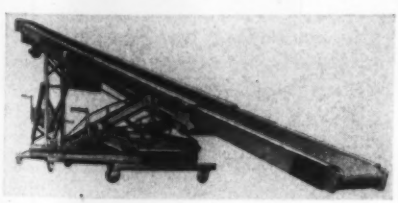


hydraulic pressure pad. An overhanging type ram that operates in nickel cast iron gibs permits bending over the top of the punch. With this construction all operational strains are taken off the cylinder packings.

Check No. 1 on Reply Card for more Details

Expanding Length Conveyor

The Adjustoveyor, a ten-position conveyor offered by Stewart-Glapat Corp., Zanesville, O., is a dual unit—a standard length unit and an extreme length unit. It may be used inside or outside the plant for handling of packages or any material



that can be placed on a moving belt. It can be extended the full length of a trailer body and then withdrawn if necessary, thus eliminating the need of carrying loads to the unit.

By withdrawing the boom, the conveyor can go over aisleways and yet permit passage of other equipment, the boom being controlled by separate power. Availability is in all standard widths and with side rails when necessary. A total distributed load of 850 and a net unit load of 150 pounds before belt slippage may be carried. The roller type will carry a proportionately heavier load. Standard lengths are 8 feet closed to 14 feet 6 inches open, 10 to 18 feet; 15 to 27 feet; 20 to 38 feet open; 32 to 55 feet 6 inches open.

Check No. 2 on Reply Card for more Details

Portable Vacuum Cleaner

Capable of operating one 35-foot length of vacuum cleaning hose is a small portable vacuum cleaner, the Hoffco-Vac No. 15 manufactured by U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y. The 1½ hp machine is 21½ inches wide,

40½ inches long and 43¼ inches high. It has a dust collector of adequate capacity for continuous service.

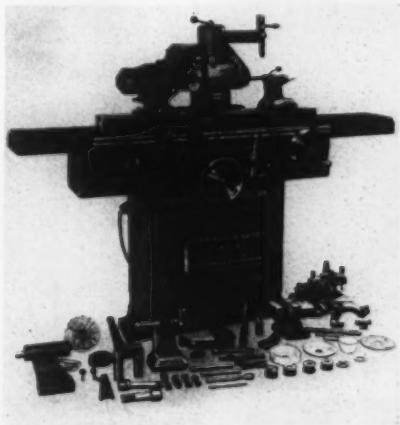
The dust separator is fitted with four inverted type filter bags. Inlet to the dust separator is tangential; dust enters the separator below the bag level to prevent any impact on the bag. Heavier and larger quantities of dust are separated by centrifugal action. Dust container is released by a lever and is equipped with handles for easy emptying. Vacuum producer is of the multiple stage centrifugal type. Class 1 group D and class 2 group G motors for use in hazardous locations may be incorporated.

Check No. 3 on Reply Card for more Details

Cutter and Tool Grinder

Swinging work up to 12 inches in diameter and taking 28 inches between work head center and tailstock center is the model 62 motor driven power feed universal cutter and tool grinder offered by Gallmeyer & Livingston Co., Grand Rapids, Mich. It is 6 inches wide and 42 inches long with a single 9/16-inch T-slot running its entire length. Longitudinal table has a movement of 24 inches.

Machine has a cabinet base and incorporates antifriction ball bearing table. Raising and lowering of the grinding wheel head and cross feeding of head and column are arranged so that subtable and table remain fixed as to vertical or transverse

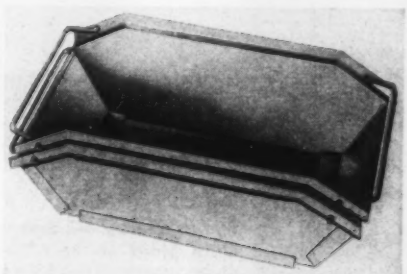


movement. A Bijur one-shot lubrication system is incorporated. Optional power feed provides for an infinite number of longitudinal table speeds from 4 to 100 inches per minute. Three longitudinal table speeds of ½, 3½ and 8¼ inches per revolution of handwheel are provided.

Check No. 4 on Reply Card for more Details

Nesting Materials Handling Box

Usable by two workers as well as one, as parts are readily accessible and can be withdrawn from either end, is the twin hopper Nestier handling box, built by United Carriers



& Fabricators Inc., Cincinnati, O. Two or more units can be tiered, producing a parts bin for lowering at one end and withdrawing from the other. Units can be nested, at the rate of 55 in a 5-foot stack.

Standard box is 9¼ x 17½ inches

WHEELABRATOR saves $9525
AIRLESS BLAST CLEANING A YEAR

at the MAJESTIC CO. Huntington, Indiana

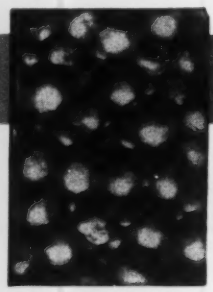
	FORMER METHOD	WHEELABRATOR METHOD
MACHINE	8 tumbling mills	66" Wheelabrator Swing Table
PRODUCTION	125 tons per month	125 tons per month
LABOR	2 men at 9 hours each 18 man hours daily	1 man at 8 hours — 8 man hours daily
CLEANING COST	Per Ton — $13.29	Per Ton — $6.94

SAVINGS per ton $6.35 per month $793.75 per year $9525.00

Gray iron castings ranging in weight from a few ounces up to 400 pounds are cleaned in Majestic's foundry.

Since the Wheelabrator Swing Table was installed the bulk of their production changed from large, heavy furnace work to thousands of small, relatively fragile pieces. According to Mr. Claude Morgan, Plant Supt., it would have been impossible to operate the foundry profitably without the Wheelabrator Swing Table—breakage would have been prohibitive and labor costs excessive.

Costs go down—profits go up, when you use Wheelabrator. Write today for full information.



After 1500 passes

TRU-STEEL shot lasts longer

By replacing Chilled Iron Shot with TRU-STEEL an Ohio plant saved 62% on the cost of shot and machine parts. TRU-STEEL shot lasts many times longer than chilled iron because it wears down slowly without breaking down.

A test will show you how much you can save. Write today for descriptive Bulletin No. 59.

American WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St. Mishawaka 5, Indiana

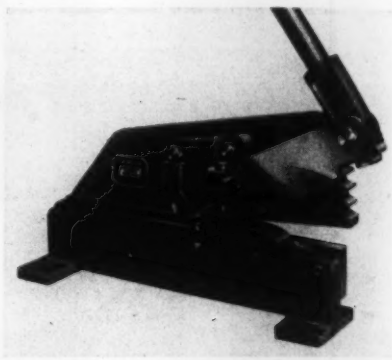
WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

and has an inside depth of 5½ inches. It is made of 18-gage steel, spot welded and is also available in other sizes and materials.

Check No. 5 on Reply Card for more Details

Geared Action Slitting Shears

Hand lever slitting shears offered by Julius Blum & Co. Inc., 532 W. 22nd St., New York 11, N. Y., have an offset unbreakable steel plate frame that enables it to cut sheet or plate of any length or width. Shears are made in five models, the smallest having a capacity of ⅛-inch mild steel and the largest a capacity of 5/16-inch mild steel plate. Shears up to 3/16-inch capacity are operated by toggle action as shown in the photograph, while shears with ¼ and 5/16-inch capacity have a geared action.



On geared action shears the lever handle is equipped with gear teeth which engage a rack cut into the machine. Shears are operated by a single stroke of the lever. All have hold downs adjustable for thickness of material being cut. Machine will cut flats and rounds as well as sheet steel.

Check No. 6 on Reply Card for more Details

Vapor Steam Cleaning Machine

Full operating pressure is generated within 90 seconds on the heavy duty type vapor steam cleaning machine announced by General Equipment Division, Sterod Mfg. Co., 444 Frelinghuysen Ave., Newark 5, N. J. A switch generates a spark which ignites the burner and puts the machine in action. Fully automatic controls maintain operation and eliminate adjustment. Entire system is automatically protected from excessive pressure at three independent points.

No premixing of cleaning compound is necessary; from the point at which dry compound is placed in the tank until it emerges as steam from the gun, the whole mixing operation is automatic. Burner will

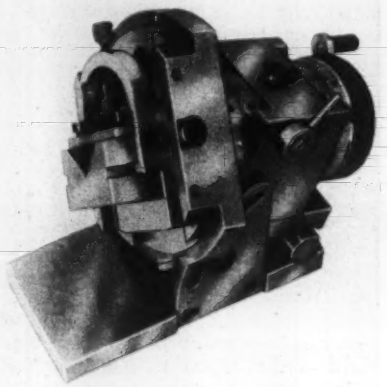
operate on kerosene, No. 1 or 2 fuel oil or light diesel oil, as well as crank case transmission and rear axle drainings. Cleaner is available in stationary or portable models of 100 or 200 gallon capacities.

Check No. 7 on Reply Card for more Details

Fixture Grinds Irregular Shapes

Available from Star Gauge Co. Inc., 261 Oak Grove Ave., Springfield, Mass., is a precision grinding fixture, the face plate of which incorporates a V-block that can be set off center in both directions to permit grinding of such items as rectangular punches, requiring a radius at one corner.

Two setting rings with finely cut verniers provide a rapid and accurate

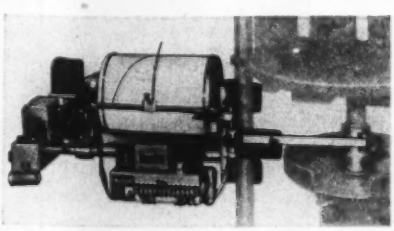


means of setting included angles to any number of degrees on either side of any reference line. All parts are hardened and ground. Grinding of rounds, flats, indexed sections, splines, radii, groove slots, etc., is possible.

Check No. 8 on Reply Card for more Details

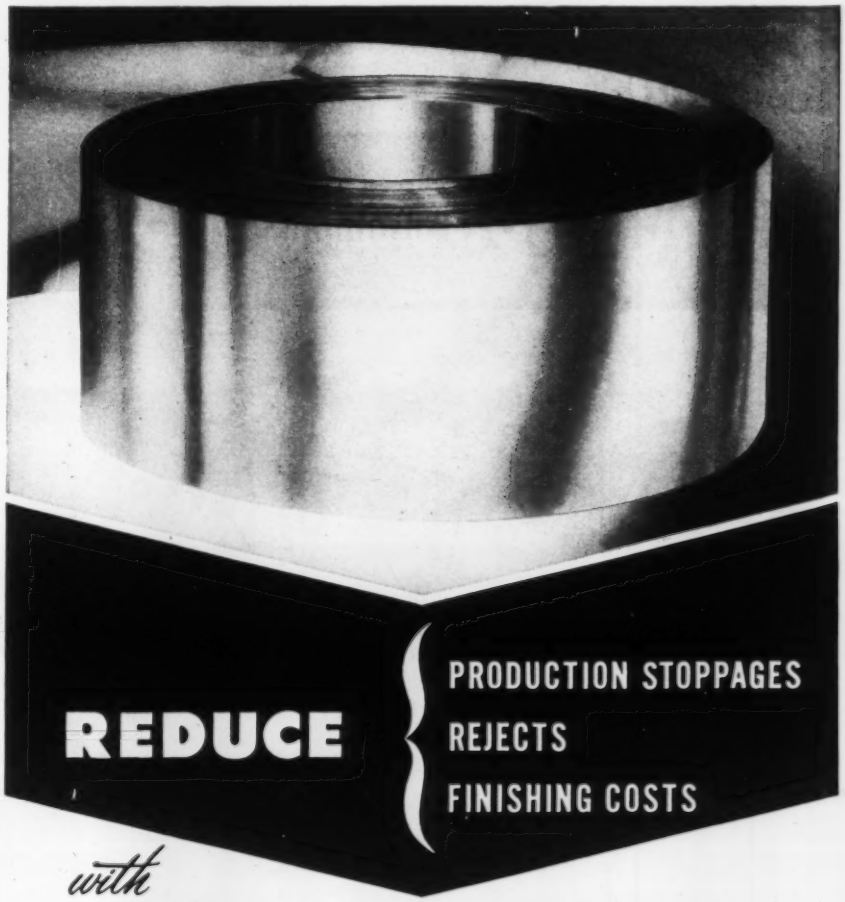
Finds Hot Deformation

Foundry sand that expands to cause casting surface defects may be measured for hot deformation by the No. 791 hot deformation recorder of-



fered by Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, Mich. It may be used with any model of the company's Dilatometers.

Device will determine whether sand expansion will cause a mold fracture or whether it will perform satisfac-



with

WALLINGFORD

Custom-Tailored

STRIP STEEL

Wallingford steel is cold processed to meet your most exacting requirements. Precision rolling and slitting, with the latest equipment, provides you with your specified width and thickness tolerances every inch of the way. With this Wallingford custom-tailored strip you obtain uniform fabrication characteristics; eliminate costly production stoppages and high rejects; improve your profit picture.

LOOK TO WALLINGFORD STEEL FOR LEADERSHIP IN THE PRODUCTION OF:

STAINLESS STRIP — Up to 24" in all grades. Bright Annealed 18-8 — To 15" wide — From .005 gage. Mirror-like surface materially reduces finishing costs.

HIGH AND LOW CARBON STRIP AND COIL — Closer gage tolerances mean fabrication of more finished parts per hundred pounds of steel.

RESISTANCE WELDED TUBING — From strip to tube, every inch a Wallingford Quality Controlled product.

INVESTIGATE WALLINGFORD'S PRODUCTS TODAY. AN INQUIRY ON YOUR COMPANY LETTERHEAD WILL BE PROMPTLY ACKNOWLEDGED.

THE WALLINGFORD STEEL CO.

SINCE 1922

WALLINGFORD, CONNECTICUT, U.S.A.

LOW CARBON • HIGH CARBON

ALLOY • STAINLESS • STRIP and TUBING

Remember

Ingersoll produces all 3

STEELS THAT RESIST CORROSION

STEELS THAT RESIST HEAT

STEELS FOR LOWEST COST STAINLESS PROTECTION

Most users of Stainless-Clad steel know the 20-year record of IngAclad. Countless applications in all of the Process Industries have proved its dependability and real economy. Where protection has been needed on *both* sides of the metal, Ingersoll solid stainless sheets have also had wide acceptance.

But do you know that Ingersoll heat-resisting steels have also made an outstanding record in such applications as furnaces, ovens, etc., where excessively high temperatures are applied?

ENGINEERING B-W PRODUCTION

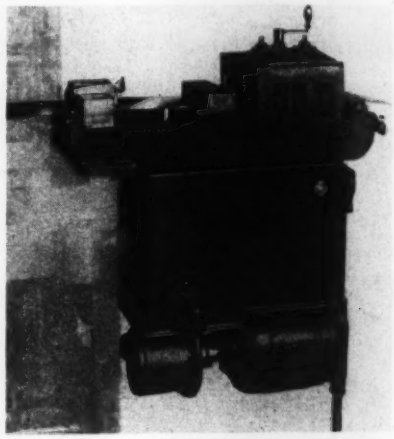
Ingersoll STEEL DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue, Chicago 4, Illinois
Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

torily. If the sand mass possesses enough plasticity no rupture will occur. An indicating model, the No. 790 hot deformation recorder, is also available.

Check No. 9 on Reply Card for more Details

Stock Feed for Punch Presses

Special Engineering Service Inc., 8161 Livernois Ave., Detroit 4, Mich., is offering the Haller gripper type stock feed for use on almost any punch press. The model 8FTS, hydraulically-operated unit has a stock handling capacity up to 8 inches wide. It will feed any desired length up to



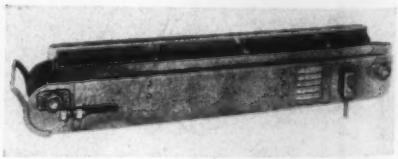
24 inches. Accuracy of feed is guaranteed within 0.003 to 0.005-inch on each stroke.

Installation and adjustments may be made quickly so that feed may be removed to other presses when desired. Actuation is from press ram. Sufficient power is available to pull the stock through a roll-type straightener, an integral part of the unit. Mounting is on the bolster plate. Feed can be located for operation from left to right, right front or back.

Check No. 10 on Reply Card for more Details

For Small Conveying Uses

Only 5-feet long and equipped with an 8-inch Neoprene-impregnated belt is the model 100-U conveyor, built



by Industrial Engineering & Mfg. Co., Brimfield, Ind. Flights are 1⅜ inches in height spaced on 18-inch centers. It is also available without the flights. Belt speed is about 125 fpm.

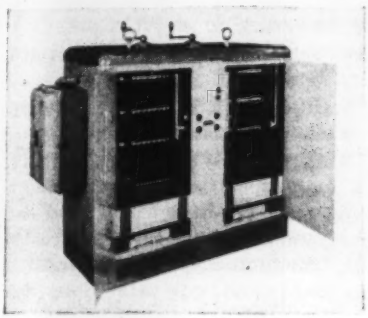
Take-up mechanism provides for belt adjustment and pulleys are

equipped with permanently lubricated steel ball bearings. Unit is powered by 1/12-hp motor mounted inside the conveyor channel. A thermal switch is located on the side of the channel. Side rails extend the full length of the conveyor and may be removed when it is used for handling cartons or bulky material.

Check No. 11 on Reply Card for more Details

Dual DC Welders

Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa., is manufacturing dual 300/600 and 400/800 amp selenium rectifier direct current welders. Each dual unit offers two welding circuits in one common enclosure. These circuits may be used independently or in parallel to pro-



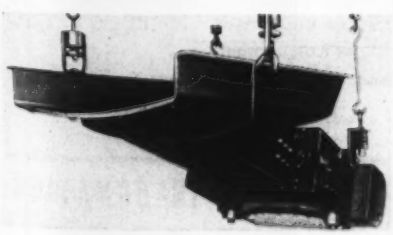
vide a single circuit of twice the capacity.

Parallel operation of the two units for maximum capacity is obtained by means of a bridle placed across the secondary output terminals. A clutch and sprocket and chain arrangement makes possible independent or unit operation of the current control handles on each individual welder. Primary contactor is supplied to facilitate use on automatic or stud welding applications.

Check No. 12 on Reply Card for more Details

Dust-Tight Vibratory Feeders

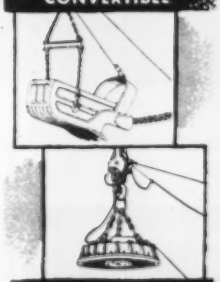
Syntron Co. 370 Lexington Ave., Homer City, Pa. is offering a heavy-duty Vibra-Flow vibratory feeder of dust-tight design. Working parts,



leaf springs, armature and core, are covered by gasket-sealed plates bolted to the magnet casting.

By enclosing these parts protec-

COMPLETELY CONVERTIBLE

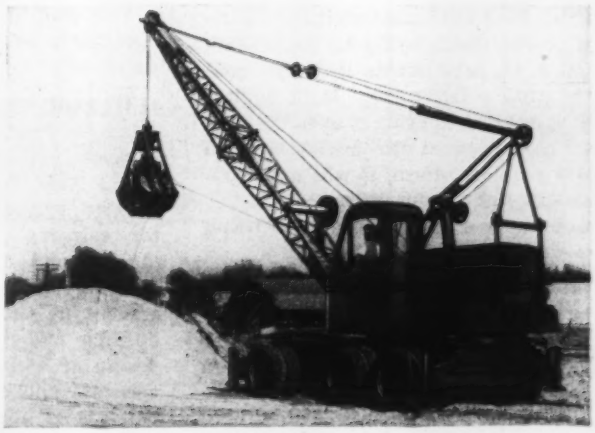


TO ALL ATTACHMENTS

Built by modern precision methods, the UNIT 1520 leads the field in quality, and dependable performance. Designed for both "on and off" highway operation. So compact, it works efficiently even in small, cramped quarters, "in or out" of the yard.

- Rugged Construction
- Perfectly Balanced
- Hook Roller Construction
- Operated by ONE Man
- Powered by ONE Engine
- Hydraulic Steering
- Air Brakes and 4 Speed Air-Actuated Transmission
- Heavy Duty, yet operated with remarkable SPEED . . . SAFETY . . . ECONOMY!

UNIT 1520 can be equipped with retractable high A-Frame to permit capacity loads on extended boom at long radius.



UNIT CRANE & SHOVEL CORPORATION

6521 W. BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHOES • MAGNETS

A 5413-2/3CA-R

tion is obtained against clogging by excessive supply hopper spillage or heavy dust conditions. Feeder is then suitable for class 2 installations. Sealed protection does not affect the feed rate.

Check No. 13 on Reply Card for more Details

Gages Rough Bores Accurately

Air gaging of rough-surfaced bores with a high degree of accuracy is possible with a contact gaging plug for Air-O-Limit internal comparators made by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn. Rate of air flowing through the gaging plug is controlled by carbide buttons mounted on spring leaves. Buttons are depressed by contact with the work during gaging and impede the escape of air from small nozzles within the plug. Resultant change in line pressure causes the indicator to show the variation from basic diameter.

Contact plug is suited for diamond boring and reaming operations where finishes exceed 50 microinches. Plugs can be furnished with either an easy-entry bullet nose or a pilot nose that provides for fast operation. Adjustment for setup and wear of the carbide contact gaging buttons is provided. They may also be provided with chromium plating or with carbide wear strips.

Check No. 14 on Reply Card for more Details

• • •

THAWS AND MELTS: Ice-Rem, an ice-thawing and snow melting chemical powder made by Speco Inc., Cleveland 9, O., is available in highly concentrated pellet form. It is applied by sprinkling sparingly over the surface. If used at the beginning of a snow or sleet storm, it will melt subsequent light snow falls.

Check No. 15 on Reply Card for more Details

FOR USE IN DUSTY AREAS: Chicago Eye Shield Co., Chicago 12, Ill., offers No. 600 Air-Fed hood for use in toxic dust and fumes. Air fed into the hood is tubed to each side of the face, then diffused and filtered through cloth bags so that a constant supply of clean cool air is maintained directly in the respiratory zone.

Check No. 16 on Reply Card for more Details

COMBINATION STARTER: A new combination starter that conforms to the automotive manufacturers' Joint Industry Conference electrical standards for industrial equipment is available from General Electric's Control Divisions, Schenectady, N. Y. It is made in both fusible and nonfusible types. A drip channel across the top and around the sides of its steel enclosure prevents liquids spilled on the case from entering around the door.

Check No. 17 on Reply Card for more Details

RESURFACE OLD FLOORS: Designed for resurfacing old floors of concrete, wood, or steel, Superset plastic rock has been developed by United Laboratories Inc., Cleveland 2, O. It is available in several gradings depending on the type of application for which materials is specified.

Check No. 18 on Reply Card for more Details

MEASURES STRAIN: A new strip chart strain recorder for continuous measurement of surface strain in structures or machines by a SR-4 resistance wire strain gage is announced by Baldwin Locomotive Works, Philadelphia 42, Pa. Recorder is an electronic type instrument designed and calibrated for use with two SR-4 gages having a resistance of 120 plus or minus 1.2 ohms and a sensitivity factor between 1.9 and 2.2.

Check No. 19 on Reply Card for more Details

UTILITY MIXER: For investigating and testing molding and core sand mixtures or for preparation of any laboratory samples, experimental batches can be mixed with the new utility mixer offered by Claud S. Gordon Co., Chicago 16, Ill. It is hand operated and has a stainless steel mixing bowl 12 inches in diameter and 5½ inches high.

Check No. 20 on Reply Card for more Details

JUG FOR CHEMICALS: Baker & Adamson Products, General Chemical Division, Allied Chemical & Dye Corp., New York 6, N. Y., has developed a molded polyethylene jug for shipping hydrofluoric acid and other liquid chemicals in small industrial lots. It is sealed with a screw-type polyethylene cap, making opening and reclosing easy. Special design of neck and lip assures clean, accurate pouring.

Check No. 21 on Reply Card for more Details

INDIVIDUALLY MOUNTED BREAKERS: Types G-25 and G-50 low voltage air circuit breakers are now available for individual mounting from Allis-Chalmers Mfg. Co., Milwaukee, Wis. They have a sheet steel enclosure formed and welded into a housing that completely encloses the circuit breaker and cable connections.

Check No. 22 on Reply Card for more Details

REMOVES, PREVENTS SCALE: Luminite, a coagulant which combines all advantages of chemical and colloidal methods, is designed for removal and prevention of scale formation, elimination of pitting, congestion, rust, corrosion, foaming and priming in steam boiler. Developed by Warren Refining & Chemical Co., Cleveland, O., it is formulated to the customer's specifications.

Check No. 23 on Reply Card for more Details

CLEAN BY CENTRIFUGAL FORCE: Known as Airfuge, a complete line of separators for cleaning compressed air by centrifugal force, is announced by Swartwout Co., Cleveland 12, O. They are available in seven inlet and outlet tapping sizes from ½ to 2½ inches. A float-operated trap automatically releases accumulated liquids as they rise to a level above that necessary to effect a seal.

Check No. 24 on Reply Card for more Details

STRIP-CHART INSTRUMENT: Strip-chart Dynamaster, introduced by Bristol Co., Waterbury 20, Conn., is a high-speed, self-balancing alternating current bridge designed for measurement of temperature, resistance, conductivity, strain, position, inductance and any other variable which can be measured in terms of impedance. Instruments are available for as many as 16 different records on the same chart.

Check No. 25 on Reply Card for more Details

TELESCOPING GAGES: No. 579 telescoping gage, made by L. S. Starrett Co., Athol, Mass., has an automatic self-centering handle. Both contact plungers telescope within each other. Ends of plungers are rounded to give true diameter measurements and are hardened and ground. Gage is available in six sizes, either in complete sets or singly, to measure from 5/16 to 6 inches.

Check No. 26 on Reply Card for more Details

RESPIRATOR: No. 2099 Air Line respirator, offered by American Optical Co., Southbridge, Mass., protects against dusts, fumes, vapors, mists, smokes and gases. No filters or cartridges are needed.

Check No. 27 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

EXTENT of price increases just effected in the steel industry falls short of expectations by a wide margin. Up to $10 per ton on the average had been predicted recently. U. S. Steel's advance, however, averages only $5.50 per ton, less than 3/10ths of 1 cent per pound, and just about covers the wage increase averaging 16 cents per hour. Since U. S. Steel's action in a general way served as a pattern for other producers, the markup in prices means the industry will absorb raw material cost increases, which Benjamin Fairless, president of U. S. Steel, several weeks ago said averaged $4 per ton for his company alone. The increase in prices by U. S. Steel is confined to base prices.

COMPOSITES— STEEL's price composites, compiled as of Nov. 30, are unchanged from the preceding week since the price advances announced by U. S. Steel and others did not become effective until Dec. 1. The weighted index on finished steel held last week at 157.76 as did the arithmetical composite at $95.09. Pig iron composites are steady with basic iron, $49.04, No. 2 foundry, $49.54, and malleable, $50.27. The steelmaking scrap composite is unchanged at $41 but renewed strength is noted.

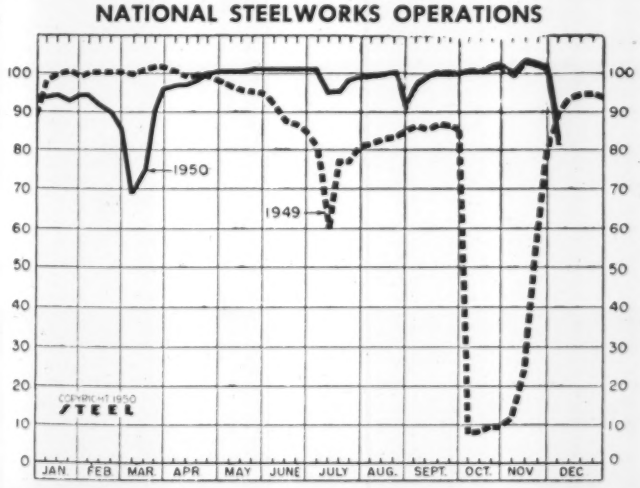
OPERATIONS— Old Man Winter took steelmaking and metalworking operations in general for a precipitous toboggan ride last week. The national ingot rate dropped an estimated 21 points to 81.5 per cent of capacity on the heels of an unprecedented snowstorm which hit north-central and eastern sections of the nation Nov. 24 and 25. Transportation was snarled in knots and industrial operations virtually halted over a wide area until around midweek. The storm cost in lost steel production is estimated around 450,000 net tons of ingots. Loss in metalworking shop output and wages is staggering.

DISTRICT RATES— Pittsburgh, Youngstown and Cleveland districts were hit hardest by the storm. At Pittsburgh the ingot rate dropped 56 points to 48 per cent of capacity. Youngstown operations fell 62 points to 40, while the Cleveland rate declined 22.5 points to 78.5 per cent. At Wheeling the rate slipped 5.5 points to 94, in St. Louis, 4.5 points to 90.5, in Detroit, 4 points to 102, in Cincinnati, 3 points to 100, in New England, 3 points to 88, in Eastern Pennsylvania, 2 points to 98, and in Chicago, ½ point to 104.5 per cent. Ingot rates held unchanged at 101 in the Far West, 100 in Birmingham, and 104 in Buffalo.

DEMAND— General consumers are finding themselves in an increasingly tight position with respect to steel supplies. With the mills accepting only DO and other rated tonnage beyond January, for which latter month they are booked solidly, more consumers are turning in desperation to the premium markets for supplies. They are not having much success, however, and the prospects are not encouraging. Conversion mills are booked solidly well into 1951 and the pressure on them is unrelenting. Gray market operators could have a field day had they sufficient steel to meet all the requests coming to them for tonnage.

OUTLOOK— The faint hope held in some consuming circles of an improvement in steel supply conditions after January has been dashed by recent events. Loss of steel production due to the snowstorm of the past ten days will intensify current shortages. Delayed shipments will likely force more metalworking shops to a hand-to-mouth supply basis and jeopardize maintenance of manufacturing schedules. More serious, however, is the alarming turn of events in Korea. Military reversal of UN forces is believed certain to accelerate demand for steel for the defense effort and speed up issuance of additional priority programs and application of production controls and other regulatory measures curbing civilian industry.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Dec. 2	Change	Same Week 1949	Same Week 1948
Pittsburgh	48	—56	88	95.5
Chicago	104.5	— 0.5	92.5	99.5
Eastern Pa.	98	— 2	82	97
Youngstown	40	—62	95	105
Wheeling	94	— 5.5	99	97
Cleveland	78.5	—22.5	93.5	102
Buffalo	104	0	101	104
Birmingham	100	0	100	100
New England	88	— 3	89	90
Cincinnati	100	— 3	70	103
St. Louis	90.5	— 4.5	84.5	89.5
Detroit	102	— 4	101	100
Western	101	0	82	..
Estimated national rate	81.5	—21	89.5	100

Based on weekly steelmaking capacity of 1,906,268 net tons for first half and 1,928,271 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

News Summary—p. 61 Production-Engineering News—p. 91

Composite Market Averages

	Nov. 30 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	157.76	157.76	157.76	152.52	101.87
Index in cents per lb. ..	4.274	4.274	4.274	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$95.09	$95.09	$95.09	$91.64	$58.27
No. 2 Fdry, Pig Iron, GT	49.54	49.54	49.35	46.10	25.42
Basic Pig Iron, GT	49.04	49.04	49.04	45.60	24.75
Malleable Pig Iron, GT..	50.27	50.27	49.63	47.27	26.04
Steelmaking Scrap, GT..	41.00	41.00	41.67	29.17	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 30 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C. F., Pittsburgh....	4.15	4.15	4.15	3.95-4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia..	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ...	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia ..	3.84	3.84	3.84	3.50	2.30
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.50-75	3.50-75	3.50-75	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15-85	4.15-85	4.15-4.85	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00-15	2.90
Strip, C.R., Detroit	4.35-5.10	4.35-5.10	4.35-95	4.20-25	2.90
Wire, Basic, Pittsburgh ...	4.50-75	4.50-75	4.50-75	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30-60	5.30-60	5.30-60	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Wire rods, ⅛-⅜", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$50.00	$50.00	$47-$50	$47.00	$26.25
Basic, Valley	49.00	49.00	49.00	46.00	25.25
Basic, del. Phila.	53.39	53.39	53.39	49.44	27.09
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Chicago	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Valley	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, del. Phila. ...	53.89	53.89	53.89	49.94	27.59
No. 2 Fdry, Birm.	45.88	45.88	45.88	39.38	22.13
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	52.58	46.08	25.81
Malleable, Valley	49.50	49.50	49.50	46.50	25.75
Malleable, Chicago	49.50	49.50	46.50-49.50	46.50	25.75
Charcoal, Lyles, Tenn. ...	62.00	62.00	62.00	60.00	33.00
Ferromanganese, Etna, Pa.	175.0	175.00	175.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts...	$44.00	$44.00	$44.00	$32.00	$20.00
No. 1 Heavy Melt. E. Pa..	39.00	39.00	41.00	26.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	29.50	18.75
No. 1 Heavy Melt. Valley.	43.75	43.75	43.75	32.75	20.00
No. 1 Heavy Melt. Cleve...	43.25	43.25	43.25	30.25	19.50
No. 1 Heavy Melt. Buffalo.	41.50	41.50	41.50	29.75	19.25
Rails, Rerolling Chicago..	65.50	64.50	64.50	44.50	22.25
No. 1 Cast, Chicago	61.00	59.00	55.00	42.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	16.50	16.50	16.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.75	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York	141.00	137.50	131.00	83.00	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	32.00	32.00	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$51.00	$51.50	$52.00	$52.50
Brooklyn,N.Y.,del.	....	55.79	56.29	....
Newark,del.	53.63	54.13	54.63	55.13
Philadelphia,del.	53.39	53.89	54.39	54.89
Birmingham District				
AlabamaCity,Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward,Ala. W15	45.38	45.88	....	....
Cincinnati,del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda,N.Y., W12	49.00	49.50	50.00	....
N.Tonawanda,N.Y., T9	....	49.50	50.00	....
Boston,del.	58.26	58.76	59.20	....
Rochester,N.Y.,del.	51.63	52.13	52.63	....
Syracuse,N.Y.,del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary,Ind. C3	49.00	....	49.50	....
IndianaHarbor,Ind. I-2	49.00	....	49.50	....
So.Chicago,Ill. W14	49.00	49.50	49.50	....
So.Chicago,Ill. Y1	49.00	49.50	49.50	....
So.Chicago,Ill. C3	49.00	....	49.50	50.00
Milwaukee,del.	50.89	51.39	51.39	51.89
Muskegon,Mich.,del.	....	54.98	54.98	....
Cleveland District				
Cleveland A7	49.00	49.50	49.50	50.00
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	51.39	51.89	51.89	51.39
Lorain,O. N3	49.00	....	....	50.00
Duluth I-3	....	....	49.50	....
Erie,Pa. I-3	49.00	49.50	49.50	50.00
Everett,Mass. E1	....	52.25	52.75	....
Fontana,Calif. K1	55.00	55.50	....	....
Geneva,Utah G1	49.00	49.50	....	....
Seattle,Tacoma,Wash.,del.	....	57.20	....	....
Portland,Oreg.,del.	....	57.20	....	....
LosAngeles,SanFrancisco,del. ...	56.70	57.20	....	....
GraniteCity,Ill. M10	50.90	51.40	51.90	....
St.Louis,del. (inc. tax)	51.65	52.15	52.65	....
Ironton,Utah C11	49.00	49.50	....	....
LoneStar,Tex. L6	45.00	*45.50	45.50	....
Minnequa,Colo. C10	49.00	49.50	50.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	49.50	49.50	50.00
Pitts.,N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKeesRocks,del.	....	50.45	50.45	50.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	....	50.94	50.94	51.44
Verona,del.	....	51.40	51.40	51.90
Brackenridge,del.	....	51.63	51.63	52.13
Bessemer,Pa. C3	49.00	....	49.50	50.00
Clairton,Rankin,So.Duquesne,Pa. C3	49.00	....	....	....
McKeesport,Pa. N3	49.00	....	....	50.00
Sharpsville,Pa. S6	....	....	49.50	50.00
Steelton,Pa. B2	51.00	51.50	52.00	52.50
Swedeland,Pa. A3	53.00	53.50	54.00	54.50
Toledo,O. I-3	49.00	49.50	49.50	50.00
Cincinnati,del.	54.01	54.51	....	....
Troy,N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard,O. Y1	49.00	49.50	49.50	....
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield,O.,del.	53.26	53.76	53.76	54.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$58.50
Buffalo H1	60.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$83.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	89.50
Keokuk, OH & Fdry., 12½ lb. piglets, 16% Si, frt. allowed K2.	92.50
Wenatchee,Wash., O.H. & Fdry., frt. allowed K2	89.50

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$54.00
Steelton,Pa. B2	57.00
Philadelphia delivered	60.00
Troy,N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Nov. 30, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 .....$50.00
Fontana,Calif. K1 ....76.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)
Detroit R7 .....$51.00
Fontana,Calif. K1 ....77.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ..51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)
Bessemer,Pa. C3 ....$53.00
Clairton,Pa. C3 .....53.00
Conshohocken,Pa. A3 ..62.00
Ensley,Ala. T2 .....53.00
Fairfield,Ala T2 .....53.00
Fontana,Calif. K1 ....72.00
Gary,Ind. C3 .....53.00
Johnstown,Pa. B2 ....53.00
Lackawanna,N.Y. B2..53.00
Munhall,Pa. C3 .....53.00
So.Chicago,Ill. C3 ....53.00
So.Duquesne,Pa. C3 ...53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ....$63.00
Buffalo R2 .....63.00
Canton,O. R2 .....63.00
Clairton,Pa. C3 .....63.00
Cleveland R2 .....63.00
Conshohocken,Pa. A3 ..68.00
Detroit R7 .....66.00
Ensley,Ala T2 .....63.00
Fairfield,Ala. T2 ....63.00
Fontana,Calif. K1 ...82.00
Gary,Ind. C3 .....63.00
Geneva,Utah G1 ....63.00
Houston,Tex. S5 .....71.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2 ..63.00
LosAngeles B3 .....82.00
Munhall,Pa. C3 .....63.00
Seattle B3 .....82.00
So.Chicago C3,R2,W14..63.00
So.Duquesne,Pa. C3 ..63.00
So.SanFrancisco B8 ...82.00

Alloy (NT)
Bethlehem,Pa. B2 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2, T7 ....66.00
Conshohocken,Pa. A3..70.00
Detroit R7 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. C3 .....66.00
Houston,Tex. S5 .....74.00
Ind.Harbor,Ind. Y1 ...66.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....86.00
Massillon,O. R2 .....66.00
Midland,Pa. C18 .....66.00
Munhall,Pa. C3 .....66.00
So.Chicago C3,R2,W14..66.00
So.Duquesne,Pa. C3 ..66.00
Warren,O. C17 .....66.00
Youngstown Y1 .....66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Fontana,Calif. K1 ....100.00
Gary,Ind. C3 .....76.00
Ind.Harbor,Ind. I-2 ...76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00
So.Duquesne,Pa. C3 ...76.00

SHEET BARS (NT)
Fontana,Calif. K1 ....$86.00

SKELP
Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.15
Warren,O. R2 .....3.15
Youngstown C3, R2 ....3.15

WIRE RODS
AlabamaCity,Ala. R2 ..3.85
Buffalo W12 .....3.85
Cleveland A7 .....3.85
Donora,Pa. A7 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 ....4.60
Houston,Tex. S5 .....4.25
Ind.Harbor,Ind. Y1 ...3.85
Johnstown,Pa. B2 ....3.85
Joliet,Ill. A7 .....3.85
LosAngeles B3 .....4.65
Minnequa,Colo. C10 ....4.10
Monessen,Pa. P7 .....4.05
No.Tonawanda,N.Y. B11.3.85
Pittsburg,Calif. C11 ...4.50
Portsmouth,O. P12 ....3.85
Roebling,N.J. R5 .....3.95
So.Chicago,Ill. R2 .....3.85
SparrowsPoint,Md. B2..3.95
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....3.85
Torrance,Calif. C11 ...4.65
Worcester A7 .....4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.40
Aliquippa,Pa. J5 .....3.40
Bessemer,Ala. T2 .....3.40
Bethlehem,Pa. B2 .....3.45
Clairton,Pa. C3 .....3.40
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 ....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2 ....3.40
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S6 ....4.00
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.00
Minnequa,Colo. C10 ...3.85
Munhall,Pa. C3 .....3.40
Niles,Calif.(22) P1 ....4.02
Phoenixville,Pa. P4 ...4.25
Portland,Oreg. O4 .....4.25
Seattle B3 .....4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B8 ....3.95
Torrance,Calif. C11 ....4.00
Weirton,W.Va. W6 ....3.40

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.06
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So. Chicago, Ill. C3 ....4.06

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.15
Bessemer,Ala. T2 .....5.15
Bethlehem,Pa.(14) B3 ..6.20
Clairton,Pa. C3 .....5.15
Fairfield,Ala. T2 .....5.15
Fontana,Calif. K1 ....5.75
Gary,Ind. C3 .....5.15
Geneva,Utah G1 .....5.10
Ind.Harbor,Ind. I-2 ....5.15
Ind.Harbor,Ind. Y1 ....5.40
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y.(14)B2 5.20
LosAngeles B3 .....5.75
Munhall,Pa. C3 .....5.15
So.Chicago,Ill. C3 .....5.15
So.SanFrancisco B8 ....5.70
Struthers,O. Y1 .....5.40

Wide Flange
BethlehemPa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 ....3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
Munhall,Pa. C3 .....5.10
So.Chicago,Ill. C3 ....5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ..4.20
Munhall,Pa. C3 .....4.20
So.Chicago,Ill. C3 .....4.20
Weirton,W. Va. W6 ....4.20

BEARING PILES
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 .....3.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.35
Bessemer,Ala. T2 .....5.35
Clairton,Pa. C3 .....5.35
Cleveland J5, R2 .....5.35
Conshohocken,Pa. A3...5.60
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.35
Fontana,Calif. K1 ....5.95
Gary,Ind. C3 .....5.35
Geneva,Utah G1 .....5.35
Ind.Harbor,Ind. I-2, ...5.35
Ind.Harbor,Ind. Y1 ....5.60
Johnstown,Pa. B2 .....5.35
Munhall,Pa. C3 .....5.35
Pittsburgh J5 .....5.35
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. C3 ....5.35
SparrowsPoint,Md. B2..5.35
Warren,O. R2 .....5.35
Youngstown Y1 .....5.60

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.80
Coatesville,Pa. L7 ....4.80
Conshohocken,Pa. A3 ..4.55
Fontana,Calif. K1 ....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 ....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.75
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ..4.55
Harrisburg,Pa. C5 ....5.25
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

PLATES (Universal Mill)
Fontana,Calif. K1 ....4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.25

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.50
Aliquippa,Pa. J5 .....3.50
Ashland,Ky.(15) A10 ..3.50
Bessemer,Ala. T2 .....3.50
Clairton,Pa. C3 .....3.50
Claymont,Del. W16 ....3.90
Cleveland J5 R2 .....3.50
Coatesville,Pa. L7 .....3.90
Conshohocken,Pa. A3 ..3.75
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.50
Granite City,Ill. G4 ....4.20
Geneva,Utah G1 .....3.50
Harrisburg,Pa. C5 ....4.25
Houston,Tex. S5 .....3.90
Ind.Harbor,Ind. I-2,Y1..3.50
Johnstown,Pa. B2 ....3.50
Lackawanna,N.Y. B2 ..3.50
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.50
Pittsburgh J5 .....3.50
Seattle B3 .....4.40
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2 ..3.50
Steubenville,O. W10 ....3.50
Warren,O. R2 .....3.50
Weirton,W.Va. W6 ....3.50
Youngstown C3, R2, Y1.3.50

PLATES, Wrought Iron
Economy,Pa. B14 ....7.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.75
Ashland,lcl(15) A10 ...4.25
Cleveland,cl. R2 .....4.10
Warren,O.cl R2 .....4.10

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.45
Aliquippa,Pa. J5 .....3.45
Alton,Ill.(1) L1.....3.45
Atlanta,Ga. A11 .....4.00
Bessemer,Ala. T2 .....3.45
Buffalo R2 .....3.45
Canton,O. R2 .....3.45
Clairton,Pa. C3 .....3.45
Cleveland R2 .....3.45
Ecorse,Mich. G5 .....3.65
Emeryville,Calif. J7 ....4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ....3.45
KansasCity, Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....3.90
Niles,Calif. P1 .....4.17
N.Tonawanda,N.Y. B11.3.45
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ....3.45
S.SanFran.,Cal. B3 ....4.20
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Weirton,W.Va. W6 ....3.45
Youngstown C3, R2 ....3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.45
Atlanta A11 .....4.00
Johnstown,Pa. B2 ....3.45
Lackawanna,N.Y. B2 ...3.45
Niles,Calif. P1 .....4.17
Portland,Oreg. O4 ....4.20
SanFrancisco S7 .....4.00
Weirton,W.Va. W6 ....3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2, T7 .....3.95
Clairton,Pa. C3 .....3.95
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....3.95
Houston,Tex. S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 ....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....5.00
Massillon,O. R2 .....3.95
Midland,Pa. C18 .....3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ...3.95
Struthers,O. Y1 .....3.95
Warren,O. C17 .....4.20
Youngstown C3 .....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.20
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....4.20
Youngstown C3 .....4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Atlanta A11 .....5.35
Bessemer,Ala. T2 .....5.20
Bethlehem,Pa. B2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland R2 .....5.20
Ecorse,Mich. G5 .....5.65
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....6.25
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. I-2 ....5.20
IndianaHarbor,Ind. Y1..5.45
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
LosAngeles B3 .....5.90
Pittsburgh J5 .....5.20
So.Duquesne,Pa. C3 ....5.20
So.SanFrancisco B3 ...5.95
Struthers,O. Y1 .....5.45
Youngstown C3 .....5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.15
Ambridge,Pa. W18 ....4.15
BeaverFalls,Pa. M12,R2.4.15
Buffalo B5 .....4.15
Camden,N.J. P13 .....4.60
Carnegie,Pa. C12 .....4.15
Chicago W18 .....4.15
Cleveland A7, C20 ....4.15
Detroit P17 .....4.30
Donora,Pa. A7 .....4.15
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.15
FranklinPark,Ill. N5 ...4.15
Gary,Ind. R2 .....4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 ....4.55
Harvey,Ill. B5 .....4.15
LosAngeles R2 .....5.55
Mansfield,Mass. B5 ....4.55
Massillon,O. R2, R8 ...4.15
Midland,Pa. C18 .....4.15
Monaca,Pa. S17 .....4.15
Newark,N.J. W18 .....4.55
Plymouth,Mich. P5 ....4.40
Pittsburgh J5 .....4.15
Putnam,Conn. W18 ....4.55
Readville,Mass. C14 ...4.55
St.Louis,Mo. M5 .....4.55
So.Chicago,Ill. W14 ....4.15
SpringCity,Pa.(5) K3 ..4.55
Struthers,O. Y1 .....4.15
Waukegan,Ill. A7 .....4.15
Youngstown F3, Y1 ....4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.90
Ambridge,Pa. W18 ....4.90
BeaverFalls,Pa. M12 ...4.90
Bethlehem,Pa. B2 .....4.90
Buffalo B5 .....4.90
Canton,O. R2, T7 ....4.90
Carnegie,Pa. C12 .....4.90
Chicago W18 .....4.90
Cleveland A7, C20 ....4.90
Detroit P17 .....5.05
Donora,Pa. A7 .....4.90
Elyria,O. W8 .....4.90
Gary,Ind. R2 .....4.90
Hammond,Ind. L2, M13.4.90
Hartford,Conn. R2 ....5.20
Harvey,Ill. B5 .....4.90
Lackawanna,N.Y. B2 ..4.90
Mansfield,Mass. B5 ....5.20
Massillon,O. R2, R8 ...4.90
Midland,Pa. C18 .....4.90
Monaca,Pa. S17 .....4.90
Newark,N.J. W18 .....5.20
Plymouth,Mich. P5 ....5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 .....4.90
Warren,O. C17 .....4.90
Waukegan,Ill. A7 .....4.90
Worcester,Mass. A7 ...5.20
Youngstown F3, Y1 ....4.90

RAIL STEEL BARS
ChicagoHts.(3)1-2, C2 ..4.00
ChicagoHts.(4)1-2 .....3.45
Dallas,Tex.(4) S20 ....6.00
Franklin,Pa.(3) F5 ....4.00
FortWorth,Tex.(26) T4..4.63
Huntngtn,W.Va.(3) W7.4.00
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....3.55
Williamsport(3) S19 ....4.50
Williamsport(4) S19 ....4.60

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
McK.Rks.(S.R.) L5 ...8.60
McK.Rks.(D.R.) L5 ..11.25

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.45
Alton,Ill.(6) L1 .....3.45
Atlanta A11 .....4.00
Buffalo R2 .....3.45
Cleveland R2 .....3.45
Emeryville,Calif. J7 ..4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....4.00
Niles,Calif. P1 .....4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 .....4.70
Seattle B3, N14 .....4.20
So.Chicago,Ill. R2 ....3.45
So.Duquesne,Pa. C3 ...3.45
So.SanFrancisco B3 ....4.20
SparrowsPoint,Md. B2 ..3.45
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ...4.15
Youngstown C3, R2 ...3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .4.50
Johnstown, ¼-1" B2 ...4.35
LosAngeles B3 .....5.00
Marion,O. P11 .....4.75
Seattle B3, N14 .....5.10
SoSanFrancisco B3 .....5.00
SparrowsPt., ¼-1" B2 .4.35
Williamsport,Pa. S19 ...4.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity, Ala. R2..3.35
Ashland,Ky.(8) A10 ...3.35
Butler,Pa. A10 .....3.35
Cleveland J5, R2 .....3.35
Conshohocken,Pa. A3 ..3.60
Detroit M1 .....4.15
Ecorse,Mich.(8) G5 ...3.55
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 ....4.25
Gary,Ind. C3 .....3.35
GraniteCity,Ill. G4 ....4.05
Geneva,Utah G1 .....3.45
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 .....3.35
Lackawanna,N.Y. B2 ..3.35
Munhall,Pa. C3 .....3.35
Niles,O. N12 .....4.50
Pittsburg,Calif. C11 ...4.05
Pittsburgh J5 .....3.35
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. W14 ....3.35
SparrowsPoint,Md. B2 .3.35
Steubenville,O. W10 ....3.35
Torrance,Calif. C11 ...4.05
Warren,O. R2 .....3.35
Weirton,W.Va. W6 ....3.35
Youngstown C3, Y1 ....3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 .....4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 .....4.15
Niles,O. N12 .....5.00
Torrance,Calif. C11 ...5.15

SHEETS, H-R (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.05
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.50
Fairfield,Ala. T2 .....5.05
Fontana,Calif. K1 ....6.00
Gary,Ind. C3 .....5.05
Ind.Harbor,Ind. I-2 ....5.05
IndianaHarbor,Ind. Y1..5.30
Irvin,Pa. C3 .....5.05
Lackawanna(35) B2 ..5.05
Pittsburgh J5 .....5.05
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. C3 .....5.05
SparrowsPoint(36) B2 .5.05
Warren,O. R2 .....5.05
Weirton,W.Va. W6 ....5.30
Youngstown, C3 .....5.05
Youngstown, Y1 .....5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.20
Ecorse,Mich. G5 .....6.65
Fontana,Calif. K1 ....7.05
Gary,Ind. C3 .....6.20
Ind.Harbor,Ind. I-2, ...6.20
IndianaHarbor,Ind. Y1..6.45
Irvin,Pa. C3 .....6.20
Lackawanna(37) B2 ...6.20
Pittsburgh J5 .....6.20
SparrowsPoint(38) B2..6.20
Warren,O. R2 .....6.20
Weirton,W.Va. W6 ....6.45
Youngstown Y1 .....6.45

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.80
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind.(13) C16	4.80
MartinsFerry,O. W10	4.40
Niles,O. N12	5.50
Pittsburg, Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind.(13) C16	5.35
Niles,O. N12	6.05

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	5.30
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23) F4	5.70

SHEETS, Culvert

No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.80	...
MartinsFy.O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron

	An'l	Galv.
Apollo,Pa. B14	12.60	16.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10(cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill.G4(cut lengths)	...	...	7.40	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.50	7.00	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Ind.Har. I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	5.20
Ecorse,Mich. G5	5.40
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	5.90
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2	4.95
IndianaHarbor,Ind. Y1	5.20
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	5.30
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	5.20
Youngstown Y1	5.20
Youngstown C3	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.45
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity, Mo. S5	5.70
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.45
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.80
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.75
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.75
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.75
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.75
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.10
Carnegie,Pa. S18	10.10
Cleveland A7	9.50
Dover,O. G6	10.00
Fontana,Calif. K1	11.15
Harrison,N.J. C18	10.10
NewBritn.Conn.(10) S15	10.10
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	10.10
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.85	6.30	6.90	8.85	11.15
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	6.30	6.90	8.85	11.15
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Detroit D2	5.10	6.15	6.75	...	....
Detroit(21) D2	5.35	6.25	6.85	...	....
Dover,O. G6	5.00	6.30	6.90	8.85	11.15
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	7.20	9.15	11.45
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.85	6.30	6.90	8.85	11.15
NewCastle,Pa. B4	4.85	6.30	6.90	8.85	....
NewCastle,Pa. E5	5.00	6.30	6.90	8.85	11.15
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8; Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.85	6.30	6.90	8.85	11.15
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	10.05	12.00	14.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.00
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	4.85
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	5.10
Detroit D2	5.10
Detroit M1	4.95
Dover,O. (40) G6	5.00
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.85
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.85
NewCastle,Pa. B4	4.85
NewCastle,Pa.(40) E5	4.75
NewHaven,Conn. D2	5.35
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.85
SparrowsPoint,Md. B2	4.15
Trenton,N.J. R5	5.50
Wallingford,Conn. W2	5.35
Warren,O.(40) T5	4.75
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.80
Ecorse,Mich. G5	6.65
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.45
Youngstown Y1	6.45

STRIP, Electro Galvanized

Dover,O. G6	5.00
Warren,O. T5	4.75
Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A.M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta, A11	3.80
Riverdale, Ill. A1	3.40
Sharon, Pa. S3	3.90
Youngstown C3	3.40

WIRE, M.B Spring, High Carbon

Aliquippa, Pa. J5	5.90
Alton, Ill. (1) L1	5.90
Bartonville, Ill. (1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora, Pa. A7	5.90
Duluth A7	5.90
Fostoria, O. S1	6.20
Johnstown, Pa. B2	5.90
Los Angeles B3	6.85
Millbury, Mass. (12) N6	6.20
Monessen, Pa. P7, P16	5.90
Palmer, Mass. W12	6.20
Pittsburg, Calif. C11	6.85
Portsmouth, O. P12	5.90
Roebling, N.J. R5	6.20
So. Chicago, Ill. R2	5.90
SparrowsPoint, Md. B2	6.00
Struthers, O. Y1	5.90
Trenton, N.J. A7	6.20
Waukegan, Ill. A7	5.90
Williamsport, Pa. B2	6.00
Worcester A7, J4, T6, W12	6.20
Worcester, Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	5.70
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville, Ind. M8	5.35
Dover, O. G6	5.70
Fostoria, O. S1	6.00
Kokomo, Ind. C16	5.35
FranklinPark, Ill. T6	5.70
Massillon, O. R8	5.35
Monessen, Pa. P16	5.35
Monessen, Pa. P7	5.60
Pawtucket, R.I. (12) N8	6.00
Trenton, N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville, Ill. (1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville, Ind. M8	8.45
Fostoria, O. S1	8.90
Johnstown, Pa. B2	8.45
Kokomo, Ind. C16	8.45
Monessen, Pa. P16	8.45
Palmer, Mass. W12	8.75
Portsmouth, O. P12	8.45
Roebling, N.J. R5	8.75
Waukegan, Ill. A7	8.45
Worcester, Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville, Ill. (1) K4	10.55
Monessen, Pa. P16	10.80
Roebling, N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity, Ala. R2	4.50
Aliquippa, Pa. J5	4.50
Atlanta A11	4.85
Alton, Ill. (1) L1	4.50
Bartonville, Ill. (1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville, Ind. M8	4.60
Donora, Pa. A7	4.50
Duluth A7	4.50
Fairfield, Ala. T2	4.50
Fostoria, O. (24) S1	5.00
Houston S5	4.90
Johnstown, Pa. B2	4.50
Joliet, Ill. A7	4.50
KansasCity, Mo. S5	5.10
Kokomo, Ind. C16	4.85
Los Angeles B3	5.45
Minnequa, Colo. C10	4.75
Monessen, Pa. P7	4.75
Newark, 6-8ga. I-1	5.15
No. Tonawanda B11	4.50
Palmer, Mass. W12	4.80
Pittsburg, Calif. C11	5.45
Portsmouth, O. P12	4.50
Rankin, Pa. A7	4.50
So. Chicago, Ill. R2	4.50
So. SanFrancisco C10	5.45
SparrowsPoint, Md. B2	4.60
Sterling, Ill. (1) N15	4.80
Struthers, O. Y1	4.50
Torrance, Calif. C11	5.45
Waukegan, Ill. A7	4.50
Worcester, Mass. A7	4.80
Worcester, Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa, Pa. J5	5.55
Alton, Ill. (1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora, Pa. A7	5.55
Duluth A7	5.55
Johnstown, Pa. B2	5.55
Los Angeles B3	6.50
Monessen, Pa. P7, P16	5.55
NewHaven, Conn. A7	5.85
Palmer, Mass. W12	5.85
Pittsburg, Calif. C11	6.50
Portsmouth, O. P12	5.55
Roebling, N.J. R5	5.85
So. Chicago, Ill. R2	5.55
SparrowsPoint, Md. B2	5.65
Torrance, Calif. C11	6.50
Trenton, N.J. A7	5.85
Waukegan, Ill. A7	5.55
Worcester, Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville, Ill. K4	8.15
Monessen, Pa. P16	8.15
Roebling, N.J. R5	8.45
SparrowsPoint, Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquappa J5	5.35	5.80
Atlanta A11	5.70	5.95
Bartonville(1)K4	5.35	5.80
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.50
Crawfordsville M8	5.45	5.95
Donora A7	5.35	5.50
Duluth A7	5.85	5.50
Fairfield T2	5.85	5.50
Houston, Tex. S5	5.75	6.00
Johnstown B2	5.35	5.80
Joliet, Ill. A7	5.35	5.50
KansasCy. Mo. S5	5.95	6.20
Kokomo C16	5.70	5.95
LosAngeles B3	6.30	...
Minnequa C10	5.60	6.10
Monessen P7	5.60	5.85
Palmer(31) W12	4.80	...
Pitts. Calif. C11	6.30	6.45
Prtsmth. (18) P12	5.35	5.60
Rankin A7	5.35	5.50
So. Chicago R2	5.85	5.60
So. S. Fran. C10	6.30	6.80
SparrowPt. B2	5.45	5.90
Sterling, Ill. (1) N15	5.65	5.85
Struthers, O. Y1	5.35	5.60
Torrance, Cal. C11	6.30	...
Worcester A7	5.65	5.80

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.50
Bartonville(1) K4	9.80	11.50
Cleveland A7	9.80	11.20
Crawfordsville M8	9.80	11.30
Fostoria, O. S1	10.40	12.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	12.05
Palmer, Mass. W12	9.80	11.30
Pitts., Cal. C11	10.15	11.55
Prtsmth. (18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.20

WIRE, Barbed

	Col.
AlabamaCity, Ala. R2	126
Aliquippa, Pa. J5	130
Atlanta A11	133
Bartonville, Ill. (19) K4	126
Crawfordsville M8	135
Donora, Pa. A7	124
Duluth, Minn. A7	124
Fairfield, Ala. T2	124
Houston, Tex. S5	134
Johnstown, Pa. B2	130
Joliet, Ill. A7	124
KansasCity, Mo. S5	138
Kokomo, Ind C16	135
Minnequa, Colo. C10	136
Monessen, Pa. P7	133
Pittsburg, Calif. C11	144
Portsmouth, O. (18) P12	126
Rankin, Pa. A7	124
So. Chicago, Ill. R2	126
So. SanFran., Calif. C10	151
SparrowsPoint, Md. B2	132
Sterling, Ill. (1) N15	133

FENCE POSTS

	Col.
ChicagoHts., Ill. C2	125
Duluth A7	116
Franklin, Pa. F5	125
Huntington, W.Va. W7	125
Johnstown, Pa. B2	125
Joliet, Ill. A7	116
Marion, O. P11	125
Minnequa, Colo. C10	121
Moline, Ill. R2	112
So. Chicago R2	116
Williamsport, Pa. S19	140

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity, Ala. R2	116
Ala. City, Ala. 17-18ga. R2	198
Aliquippa, Pa. 9-14½ga. J5	120
Atlanta A11	123
Bartonville, Ill. (19) K4	116
Crawfordsville, Ind. M8	123
Donora, Pa. A7	114
Duluth A7	114
Houston, Tex. S5	124
Fairfield, Ala. T2	114
Johnstown, Pa. B2	120
Johnstn, 17ga. 6" B2	194
Johnstn, 17ga. 4" B2	197
Joliet, Ill. A7	114
KansasCity, Mo. S5	128
Kokomo, Ind. C16	123
Minnequa, Colo. C10	128
Monessen, Pa. P7	123
Pittsburg, Calif. C11	137
Portsmouth, O. (18) P12	116
Rankin, Pa. A7	114
So. Chicago, Ill. R2	116
Sterling, Ill. (1) N15	118

BALE TIES, Single Loop Col.

AlabamaCity, Ala. R2	113
Atlanta A11	119
Bartonville, Ill. (19) K4	113
Chicago W13	113
Crawfordsville M8	120
Donora, Pa. A7	113
Duluth A7	113
Fairfield, Ala. T2	113
Joliet, Ill. A7	113
KansasCity, Mo. S5	125
Kokomo, Ind. C16	120
Minnequa, Colo. C10	118
Pittsburg, Calif. C11	137
So. Chicago, Ill. R2	113
So. SanFran., Calif. C10	137
SparrowsPoint, Md. B2	115
Sterling, Ill. (1) N15	119

AXLES

Ind. Harbor, Ind. S13	5.25
Johnstown, Pa. B2	5.25

JOINT BARS

Bessemer, Pa. C3	4.40
Fairfield, Ala. T2	4.40
Ind. Harbor, Ind. I-2	4.40
Joliet, Ill. C3	4.40
Lackawanna, N.Y. B2	4.40
Minnequa, Colo. C10	4.40
Steelton, Pa. B2	4.40

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1	5.60
KansasCity, Mo. S5	5.85
Lebanon, Pa. B2	5.60
Minnequa, Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So. Chicago, Ill. R2	5.60
Struthers, O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity, Ala. R2	106
Aliquippa, Pa. (13) J5	106
Atlanta A11	113
Bartonville, Ill. (19) K4	106
Chicago, Ill. W13	106
Cleveland A9	111
Crawfordsville, Ind. M8	112
Donora, Pa. A7	106
Duluth A7	106
Fairfield, Ala. T2	106
Galveston, Tex. D7	114
Houston, Tex. S5	114
Johnstown, Pa. B2	106
Joliet, Ill. A7	106
KansasCity, Mo. S5	118
Kokomo, Ind. C16	112
Minnequa, Colo. C10	111
Monessen, Pa. P7	112
Pittsburg, Calif. C11	125
Portsmouth, O. P12	106
Rankin, Pa. A7	106
So. Chicago, Ill. R2	106
SparrowsPoint, Md. B2	108
Sterling, Ill. (1) N15	112
Torrance, Calif. C11	126
Worcester, Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity, Ala. R2	5.35
Bartonville, Ill. (19) K4	5.35
Crawfordsville, Ind. M8	5.90
Donora, Pa. A7	5.35
Duluth A7	5.35
Johnstown, Pa. B2	5.35
Joliet, Ill. A7	5.35
Kokomo, Ind. C16	5.65
Minnequa, Colo. C10	5.60
Pittsburg, Calif. C11	6.30
Portsmouth, O. P12	5.35
Rankin, Pa. A7	5.35
So. Chicago, Ill. R2	5.35
SparrowsPoint, Md. B2	5.45
Sterling, Ill. (1) N15	5.65
Worcester, Mass. A7	5.65

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa. A3	$6.75
Wheeling, W.Va. W10	6.75

TIE PLATES

Fairfield, Ala. T2	4.20
Gary, Ind. C3	4.20
Ind. Harbor, Ind. I-2	4.20
Lackawanna, N.Y. B2	4.20
Minnequa, Colo. C10	4.20
Pittsburg, Calif. C11	4.35
Seattle B3	4.35
Steelton, Pa. B2	4.20
Torrance, Calif. C11	4.35
Weirton, W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity, Mo. S5	9.10
Lebanon, Pa. (32) B2	8.85
Minnequa, Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville, Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora, Pa. A7	8.05	8.05	8.30
Fostoria, O. S1	8.35	8.35	8.60
Johnstown, Pa. B2	8.05	8.05	8.30
Monessen, Pa. P16	8.05	8.05	8.30
Monessen, Pa. P7	8.30	8.30	8.55
NewHaven, Conn. A7	8.35	8.35	8.60
Palmer, Mass. W12	8.35	8.35	8.60
Portsmouth, O. P12	8.05	8.05	8.30
Roebling, N.J. R5	8.35	8.35	8.60
SparrowsPoint, Md. B2	8.15	8.15	8.40
Struthers, O. Y1	8.05	8.05	8.30
Trenton, N.J. A7	8.35	8.35	8.60
Waukegan, Ill. A7	8.05	8.05	8.30
Williamsport, Pa. B2	8.15	8.15	8.40
Worcester, Mass. J4, T6	8.35	8.35	8.60

RAILS

	Std. No. 1	Std. No. 2	Std. No. 2	TeeRails 60 lb Under
Bessemer, Pa. C3	3.40	3.30	3.35	3.75
Ensley, Ala. T2	3.40	3.30	...	3.75
Fairfield, Ala. T2	...	...	...	3.75
Gary, Ind. C3	3.40	3.30	3.35	...
Huntington, W.Va. W7	...	...	...	3.75
Ind. Harbor, Ind. I-2	3.40	3.30	3.35	...
Johnstown, Pa. B2	...	...	...	(16) 3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa, Colo. C10	3.40	3.30	...	4.25
Steelton, Pa. B2	3.40	3.30	...	...
Williamsport, Pa. S19	...	...	...	4.25

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Porthsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv., EatonMfg.
S1 Senaca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Corp.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base
(13) Add 0.50c for 17 Ga & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 14 gage.
(24) Deduct 0.20c for finer than 15 gage.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (⅜" bar elec. furn. billet, 5.03c); to consumers, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	33.5	4.0	2.0	4.0
¼	6.0	0.42	33.5	31.5	30.5	4.0	2.0	5.0
⅜	6.0	0.67	29.0	27.0	26.0	+1.5	+3.5	0.5
½	8.5	0.85	40.5	38.5	39.5	18.5	16.5	18.5
¾	11.5	1.13	43.5	41.5	42.5	22.5	20.5	21.5
1	17.0	1.68	46.0	44.0	45.0	26.0	24.0	25.0
1¼	23.0	2.28	46.5	44.5	45.5	26.5	24.5	25.5
1½	27.5	2.78	47.0	45.0	46.0	27.5	25.5	26.5
2	37.0	3.68	47.5	45.5	46.5	28.0	26.0	27.0
2½	58.5	5.82	48.0	46.0	47.0	28.5	26.5	27.5
3	76.5	7.62	48.0	46.0	47.0	28.5	26.5	27.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 48% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa, J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. P9 quotes 1½ pts higher on ⅛" and ¼", 2 pts higher on ⅜", 1½ pts higher on ½" and ¾", 1 pt higher on 1" and 1¼", ½ pt higher on 1½" through 3"; Sharon, Pa. M6 quotes 1 pt lower on ⅛", 1½ pts higher on ¼", ½ pt higher on ⅜" and 1 pt lower on ½", ½ pt lower on ¾", 1½ pts lower on 1" and 1¼", 2 pts lower on 1½" through 3"; Butler, Pa. F6, ⅛" through ⅜"; Benwood, W. Va. W10 quotes 3 pts lower on ⅛", 2 pts lower on ¼", 3 pts lower on ⅜"; Wheatland, Pa. W9 quotes ½ pt lower on ⅛" and ¼", 2½ pts higher on ½" and ¾", 2 pts higher on 1" and 1¼", 1½ pts higher on 1½" through 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, plus 23% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 pt lower on ⅜", 2 pts lower on 1", 1½ pts lower on 1¼", 2 pts lower on 1½" and 2", 1½ pts lower on 2½" and 3"; Etna, Pa. N2 plus 23% on 3½" and 4". Fontana, Calif. K1 quotes 11 pts lower on ½" and larger continuous weld and 11% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 3 pts lower on 2", 2½ pts lower on 2½-6 in.; Lorain, N3 quotes 1½ pts lower; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.08	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2¾	12	27.71	32.58	26.88	31.60
3	12	30.32	36.27	29.90	35.18

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	19.75	24.00	77.00
304	23.50	26.50–28.00	....	20.75–23.50	24.00–25.50	77.00
309	29.00	33.50	....	....	....	....
310	35.00	39.50	....	....	....	144.00
316	28.00	31.00–32.50	....	26.00	33.00–34.50	....
317	33.00	37.50	....	....	....	....
318	32.00	36.50	....	....	....	....
321	25.00	29.50	....	23.00	....	111.00
347	26.00	29.00–30.50	....	24.00	30.00–31.50	130.00
405	19.75	26.25	....	....	....	....
410	19.25	25.75	....	....	....	....
Nickel	31.00	41.00	33.50	45.00	....	....
Inconel	39.00	51.00	....	....	....	165.00
Monel	32.00	42.00	....	....	....	....
Copper*	....	....	21.70†	27.65‡	....	....

* Deoxidized. † 18.20c for hot-rolled. ‡ 24.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 23
- ⅝-in. & ⅞-in. 26
- 1-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

	H.P. & C.P. Reg.	Heavy
Square:		
½-in. & smaller	23	23
⅝-in. & ⅞-in..	20	15
1-in.-1½-in. ..	23	10
1⅛ in. & larger	16	10
H.R. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	24	15
1-in.-1½-in. ..	20	11
1⅛ in. & larger	17	11
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	25
1-in. & 1½-in.	27	20
1⅛ in. & larger	20	15

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.
½-in. & smaller ..	35	41
⅝-in. & ⅞-in. ...	29	36
1-in.-1½-in.	23	31
1⅛-in. & larger ..	17	21
Light		
⅞-in. & smaller		41
1-in. to ⅞-in.		35
1-in. to 1½-in.		33

STEEL STOVE BOLTS
F.o.b. plant; per cent off list in packages)
Plain finish .....56 & 10
Plated finishes ....41 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 47
- ¾-in. through 1 in. ... 40

Longer than 6 in.:
- ⅝-in. & smaller 33
- ¾-in. through 1 in. ... 18

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)
1 in. diam. x 6 in. and shorter 44
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS
(Packaged; per cent off list)
No. 10 and smaller 41
¼-in. diam. & larger .. 24
N.F. thread, all diams... 18

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
⅞-in. under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.00
8 to 16	48,60,72	17.00
7	48,60	18.64
6	48,60	19.95
4.5⅛	40	20.48
3	40	21.53
2½	24,30	22.05
2	24,30	24.15

CARBON

40	100,110	7.65
35	100,110	7.65
30	84,110	7.65
24	72 to 104	7.65
17 to 20	34,90	7.65
14	60,72	8.16
10,12	60	8.42

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	39.00	32.00	30.00
302...	39.00	34.50	30.00
303...	41.00	38.00	32.50
304...	41.00	36.50	31.50
309...	53.50	52.50	48.00
316...	54.50	56.50	47.50
321...	47.00	46.00	35.50
347...	51.50	50.00	40.00
410...	34.50	28.50	24.50
416...	35.00	35.00	25.00
420...	42.00	45.00	30.00
430...	37.00	29.00	25.00
501...	25.50	24.00	13.00
502...	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.
Baltimore, bars, wire and structurals A10.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Types 303, 416, 501 & 502, S18.
Cleveland, strip A7.
Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars C3.
Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Harrison, N. J., Types 302, 304, 316 wire and strip D6.
Massillon, all products R2.
McKeesport, Pa., bars, sheets except Type 416 C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip C4.
Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.
So. Chicago, Ill., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip, except Type 309 sheets 54.00c and bars 43.50c, J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-32.00
Toluol, one deg...21.00-28.00
Industrial xylol ..21.00-29.50
Per ton bulk, ovens
Sulphate of ammonia..$32-45
Cents per pound, ovens
Phenol, 40 (carlots, non returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38. Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge Iron 98+% Fe, carlots.	16.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.6% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Powder Flakes	44.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns.	70.00-135.00
Aluminum:	
Cariots, freight allowed	27.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Copper:	
Electrolytic	36.75
Reduced	33.75-37.00
Lead	23.00
Manganese:	
Minus 100-mesh	52.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	43.25
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	$1.575
Zinc, 10-ton lots	23.00-30.50
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed: over 1000 lb	2.80
1000 lb	3.05
less than 1000 lb	3.00
98.8% minus 65 mesh, freight allowed: 1000 lb and over	3.65
less than 1000 lb	3.75
Molybdenum: 99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvl.,fur.	$14.00-14.50
Connellsvl.,dry.	16.00-17.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	24.30
Chicago, ovens	21.00
Chicago del.	22.45
Detroit, del.	24.91
Terre Haute, ovens	22.60
Milwaukee, ovens	23.00
Indianapolis, ovens	22.00
Chicago, del.	25.87
Cincinnati, del.	24.92
Detroit, del.	25.90
Ironton, O., ovens	21.50
Cincinnati, del.	24.06
Painesville, O., ovens	23.25
Buffalo, del.	25.37
Cleveland, del.	24.97
Erie, Pa., ovens	22.50
Birmingham, ovens	19.40
Birmingham, del.	20.45
Philadelphia, ovens	22.10
Neville Island, Pa., ovens	22.00
Swedeland, Pa., ovens	22.00
St. Louis, ovens	22.99
St. Louis, del.	24.12
Portsmouth, O., ovens	21.50
Cincinnati, del.	24.06
Detroit, ovens	23.00
Detroit, del.	*24.00
Buffalo, del.	26.04
Flint, del.	25.44
Pontiac, del.	24.39
Saginaw, del.	25.75

Includes representative switching charge of*, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York (c'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city)	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.58	7.48
Boston (c'try)	5.75	6.55	7.69	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city)	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city)	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try)	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va.	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va.	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash. (w'hse)	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††§	5.55	5.85	7.15
Buffalo (w'hse)	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††§	5.35	5.65	6.95
Pitts. (w'hse)	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††§	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse)	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city)	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75††§	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.96	6.95	5.10	...	5.10	5.65	9.55††§	5.25	5.40	6.60
Milwaukee (city)	5.49	6.29	7.29	5.44	...	5.44	6.09	9.89††§	5.59	5.74	6.94
Milwau. (c'try)	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69††§	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse)	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.98
Kans. City (city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity (w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.80	6.10	6.30§	5.25	...	5.25	6.88	...	5.40	5.70	7.88
Birm'hm (w'hse)	5.15	5.95	6.15§	5.10	...	5.10	...	...	5.25	5.55	...
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)	5.90	7.45	7.70	5.85	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco	6.50§	7.60§	7.50§	7.45§	8.25§	6.30§	7.55	...	6.30§	6.40§	8.50§
Seattle-Tacoma	6.60	8.15§	...	6.85	...	6.35	8.50	10.10	6.20	6.35†	8.40†

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; §—500 to 1499 lb; §—450 to 1499 lb; §—1000 to 1999 lb; †—300 to 999 lb; §—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $166.20.

High-Heat Duty: Salina, Pa. $99.60; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73; chemical-bonded chrome brick, $77; magnesite brick, $99; chemical-bonded magnesite, $88.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic dead-burned, ⅜" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Nario, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	*$19.50*
45% no ratio	*20.00*
48% no ratio	*27.00*
50% no ratio	*28.00-28.50*
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb. molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l., packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $174, f.o.b. Birmingham; $187, Johnstown, Pa.; $185, Sheridan, Pa.; $175, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.60c per lb of alloy; carload packed, 10.35c, ton lot 11.25c, less ton 12.25c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%,

(*Please turn to page 167*)

NPA Limits Civilian Copper Use

Order M-12 applies to all copper and copper-base alloy mill and foundry products. Inventories are restricted to 45-day supply for producers; 60-day supply for users

Washington—National Production Authority issued order M-12 last week, limiting nondefense production and use of brass mill and copper wire mill products by total weight to 85 per cent in January, 85 per cent in February and 80 per cent in March; foundry products to 100 per cent of the average quarterly production and use during first six months of 1950. During December, users may consume up to 100 per cent of their average monthly consumption during October and November, 1950.

Order M-12 applies to all unalloyed copper and copper-base alloy, including scrap, as well as brass mill, copper mill and foundry products. It applies to all producers and users of these products, including those who use copper or copper-base alloy containing 40 per cent or more copper by weight in the production of other metals or alloys.

Exemptions—Exempt from the order are those who use less than 1000 pounds of copper or copper-base alloy during a calendar quarter. Use of copper and copper-base alloy for maintenance, repair and operating supplies is permitted at 100 per cent of the quarterly use for this purpose during the base period.

The order also provides that inventories of copper and copper-base alloy in the hands of producers of items covered by the order are limited to a 45-day supply, or a practicable minimum working inventory, whichever is less. Inventories held by users of the products are limited to a 60-day supply, or a practicable minimum working level, whichever is less.

NPA also issued order M-11, providing for uniform distribution of rated copper and copper base alloy orders among all producers, fabricators, jobbers and warehouses. Order M-11 provides that rated orders need not be accepted, if received less than 45 days prior to the first day of the month in which shipment is requested.

Percentage ceilings on the required acceptance of rated orders, based on average monthly shipments in first half of 1950, are 5 per cent on unalloyed plate, sheet and strip; 15 per cent on unalloyed rod, bar and wire; 25 per cent on alloyed rod, bar and wire; 15 per cent each on all other products. These percentages are based on estimates of the proportion of each type of product which will be required to fill rated orders.

Metal Price Tone Is Strong

New York—Price changes in major nonferrous metal markets were restricted last week to those in tin. Undertone of others was strong.

Consumption of copper increased 2577 tons in October to 128,202 tons. This compares with deliveries of refined copper to fabricators amounting to 121,806 tons and with fabricators' sales of products having a copper content of 111,757 tons. Stocks of refined copper held by fabricators declined 7437 tons in October to 292,563 tons. Visible supply in excess of plant requirements was only 2649 tons at the end of October; this is believed to be an all-time low. With unfilled orders on fabricators' books amounting to 308,326 tons at the end of October, the deficit in their sales position amounts to 215,265 tons.

Tin — Serious reversals in the Korean War were responsible for a sharp upturn in tin prices last week.

World smelter production of tin in concentrates declined in September to 13,200 long tons from 14,300 in August, Tin Study Group reports in its preliminary summary. World production of metallic tin during September amounted to 15,300 long tons against 14,600 tons in August.

World consumption of tin metal is estimated at 12,600 tons in July, unchanged from the preceding month.

Lead—Demand for lead continues strong and in excess of available supplies. Stocks at refineries declined about 10,200 tons in October to 50,854 tons as shipments increased to a new high since May, 1941, amounting to 62,138 tons while production rose to 54,123 tons.

Zinc — American Zinc Sales Co., subsidiary of American Zinc, Lead & Smelting Co., St. Louis, will increase the premium on high grade and special high grade metal $5 a ton, effective Jan. 1, 1951. The increase is attributed to higher delivery and other sundry costs. Beginning next year, the company's premium on high grade will be 1.35 cents a pound and on special high grade 1.50 cents a pound over the price of prime western grade at E. St. Louis.

Aluminum Capacity To Jump

Washington—Details of agreements between the government and leading producers of aluminum to expand production facilities are reported.

The new agreements raise to 399,000 tons a year the aluminum which the government has contracted for since mid-November under expansion and plant re-activation programs. This figure represents a production increase of about 55 per cent over current United States output of around 700,000 tons a year. It is only 100,000 tons a year short of the 500,000 tons the government has set as the aluminum expansion goal.

Aluminum Co. of America, Pittsburgh, has agreed to expand its facilities enough to provide an additional 120,000 tons of aluminum a year, all of which is to go to the national defense stockpile. The new facilities will be added to those at Alcoa's Point Comfort, Tex., plant and at a new plant to be built at a site not yet selected, reports the General Services Administration. The Point Comfort expansion is expected to be completed by mid-1952 and the new mill by mid-1953.

Besides building the new facilities, Alcoa has agreed to reactivate its idle facilities at Messena, N. Y., and Badin, N. C., and sell the added output of 79,000 tons a year to the government.

New Plant—Reynolds Metal Co., Lexington, Ky., will build an aluminum plant with annual production of 75,000 tons. The site of the plant has not been selected, but the company hopes to have it in operation in the first-half of 1952. Reynolds also will expand production at its Jones Mill, Ark., plant by 25,000 tons annually and hopes to have this capacity in operation by early next year. General Services will buy the aluminum produced by the expanded facilities and help the company get accelerated amortization and guaranteed loans, if needed, under provisions of the Defense Production Act.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., also has agreed to expand its production by 100,000 tons and will sell the metal to the government for stockpiling.

NPA Adjusts Aluminum Controls

Washington—National Production Authority's Direction No. 1 to order M-7 provides for adjustments in certain cases for the month of December. The direction supplements the original order's provisions permitting adjustments where a business operation was commenced during or after the base period or where an undue and exceptional hardship not suffered by others in the same trade or industry occurs.

The original order restricted the use of aluminum in December to a consumer's monthly average use for the first six months of the calendar year. Direction No. 1 provides for four types of adjustments:

1. If new business operations were commenced or a new product was manufactured or produced, or additional productive or manufacturing capacity was brought into operation during or after the base period, a person may use as much aluminum in December as his average use in October and November for these purposes.

2. Where changes were made in products during or after the base period which required more aluminum than was previously used to maintain the same unit output, a consumer may use as much aluminum in December as his average use in October and November.

3. If production or manufacturing operations were shut down for more than 15 consecutive calendar days during the base period, a consumer may exclude from his base period the month or months in which the shutdown occurred.

4. Where seasonal fluctuations will make December operations greater than the monthly average in the base period, an adjustment based on the ratio between aluminum consumption in December of the last three years and that during the first six months of the same years.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass ingot: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 31.00-32.00c; No. 12 foundry alloy (No. 2 grade) 30.50-31.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.50-33.00c; grade 2, 30.75-31.50c; grade 3, 30.00-30.50c; grade 4, 29.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot, prompt, 141.00; Dec. 140.00; Jan. 139.00; Feb. 138.00; Mar. 137.00.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 34.00c; English, 32.75c; Belgian, 32.75c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York, $107-$110, nominal, per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 80.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95%, 39.91-41.61; 90%, 39.48-41.13; red brass, 85%, 38.54-40.14; 80%, 38.12-39.67; best quality, 39.15; nickel silver, 18%, 50.57-51.91; phosphor-bronze grade A, 5%, 58.49-60.20.

Rods: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95%, 39.60-41.30; 90%, 39.17-40.82; red brass 85%, 38.23-39.83; 80%, 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90%, 42.14-43.79; red brass, 85%, 41.45-43.05; 80%, 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95%, 40.20; 90%, 39.77-41.42; red brass, 85%, 38.83-40.43; 80%, 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-29.42, l.c.l. 29.17-29.92, 100,000 lb lots 28.545-29.295; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.00c; over 12-in., 23.50-24.00.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 36.59-38.34c; oval 36.09-37.84c; cast 37.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl. 31.50c up to 10,000 lb, 31.00c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 26.00*; No. 2 copper 25.00*; light copper 24.00*; composition red brass 22.50-22.75; radiators 17.75; heavy yellow brass 17.50-18.00.

* Nominal.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 26.00*; No. 2 copper 25.00*; light copper 24.00*; refinery brass (60% copper) per dry copper content 21.50.

* Nominal

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 22.50-23.00; light copper 21.00-21.50; No. 1 composition red brass 18.75-19.00; No. 1 composition turnings 18.25-18.50; mixed brass turnings 14.00; new brass clippings 18.50-19.00; No. 1 brass rod turnings 17.00-17.50; light brass 11.75-12.00; clean heavy yellow brass 15.50; new brass rod ends 17.50-18.00; auto radiators 15.25-15.50; cocks and faucets, 16.75-17.00; brass pipe 17.75-18.00.

Lead: Heavy 14.50-14.75; battery plates 8.75-9.00; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 63.00-65.00; block tin pipe 90.00; No. 1 babbitt 58.00-60.00.

Aluminum: Clippings 2S 19.00-19.50; old sheets 15.50-16.00; crankcase 15.50-16.00; borings and turnings 12.00-12.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 29-30	24.50	16.80	17.50	141.00	19.00	32.00	48.00	80.00
Nov. 28	24.50	16.80	17.50	140.50	19.00	32.00	48.00	80.00
Nov. 27	24.50	16.80	17.50	131.50	19.00	32.00	48.00	80.00
Nov. 24-25	24.50	16.80	17.50	135.00	19.00	32.00	48.00	80.00
Nov. 22	24.50	16.80	17.50	137.50	19.00	32.00	48.00	80.00
Nov. 21	24.50	16.80	17.50	144.00	19.00	32.00	48.00	80.00
Nov. 20	24.50	16.80	17.50	137.00	19.00	32.00	48.00	80.00
Nov. 16-18	24.50	16.80	17.50	132.00	19.00	32.00	48.00	80.00
Nov. 15	24.50	16.80	17.50	136.00	19.00	32.00	48.00	80.00
Nov. 14	24.50	16.80	17.50	137.50	19.00	32.00	48.00	80.00
Nov. 13	24.50	16.80	17.50	138.00	19.00	32.00	48.00	80.00
Nov. 10	24.50	16.80	17.50	130.00	19.00	32.00	48.00	80.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumers prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Nov. 30, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 30	$41.00
Nov. 22	41.00
Oct. 1950	41.37
Nov. 1949	28.96
Nov. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	46.50
No. 2 Bundles	39.00
Heavy Turnings	45.00-46.00
Machine Shop Turnings	36.00-36.50†
Mixed Borings, Turnings	36.00-36.50†
Short Shovel Turnings.	38.00
Cast Iron Borings	36.00-37.00
Low Phos. Steel	53.50-54.00

Cast Iron Grades

No. 1 Cupola Cast	**55.00-56.00**
No. 1 Machinery Cast	60.00-61.00
Charging Box Cast	**54.00-55.00**
Heavy Breakable Cast.	**53.00-54.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	63.50-64.00
Rails, 2 ft and under	66.50-67.50
Rails, 18 in. and under	67.50-68.50
Railroad Specialties	61.00-62.00

† Crushers' buying prices.

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Busheling	42.50-43.00
No. 1 Bundles	42.50-43.00
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.50-37.00
Low Phos.	46.00-46.50

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Charging Box Cast	52.00-53.00
Stove Plate	54.00-55.00
Heavy Breakable Cast	54.00-55.00
Unstripped Motor Blocks	43.00-44.00
Brake Shoes	49.00-50.00
Clean Auto Cast	64.00-65.00
Burnt Cast	45.00-46.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	69.00-70.00
Rails, 3 ft and under	69.00-70.00
Rails, 18 in. and under	70.00-71.00
Rails, Random Lengths	64.00-65.00
Cast Steel	54.00-55.00
Railroad Specialties	57.00-58.00
Uncut Tires	59.00-60.00
Angles, Splice Bars	64.00-65.00

VALLEY

No. 1 Heavy Melt. Steel	$43.50-44.00†
No. 2 Heavy Melt. Steel	39.50-40.00†
No. 1 Bundles	43.50-44.00†
Facty. Prod. Bundles	43.50-44.00†
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	35.00-35.50
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Low Phos.	46.00-46.50†

† Plus applicable springboards

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$39.00**
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	38.00
No. 1 Bundles	*39.00**
No. 2 Bundles	32.00
Short Shovel Turnings.	33.00
Machine Shop Turnings	29.00-30.00
Mixed Borings, Turnings	26.00-27.00
Low Phos. Punchings and Plate, elec. fur. grade	*50.00*
Low Phos. Plate, 5 ft & Under	*50.00*
Elec. Furnace Bundles.	46.00
Heavy Turnings	39.00
No. 1 Chemical Borings	42.00
Knuckles and couplers	*53.00-54.00*
Steel car wheels	*53.00-54.00*

Cast Iron Grades

No. 2 Cupola Cast	*52.00-53.00*
No. 1 Machinery Cast	*58.00*
No. 1 Yard Cast	49.00-50.00
Charging Box Cast	*52.00-53.00*
Heavy Breakable Cast	*52.00-53.00*
No. 1 Wheels	*64.00**
Malleable	65.00-67.00

* Nominal

CINCINNATI

No. 1 Heavy Melt. Steel	$43.50
No. 2 Heavy Melt. Steel	40.50
No. 1 Busheling	43.50
No. 1 Bundles	43.50
No. 1 Black Bundles	40.50
No. 3 Bundles	30.00
Machine Shop Turnings	*30.00*
Short Shovel Turnings	*32.00*
Mixed Borings, Turnings	*31.00*
Cast Iron Borings	*32.00*

Cast Iron Grades

No. 1 Cupola Cast	65.00
Charging Box Cast	*56.00*
Stove Plate	*52.00*
Heavy Breakable Cast	*53.00*
Unstripped Motor Blocks	40.00
Brake Shoes	34.00
Clean Auto Cast	65.00
Drop Broken Cast	67.00
Low Phos., 18 in. and under	*58.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*45.00*
R.R. Malleable	60.00
Rails, Rerolling	63.00
Rails, Random Lengths	63.00
Rails, 18 in. and under	70.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$32.50-36.00
No. 1 Bundles	*37.50-46.00*
No. 2 Bundles	*32.50-35.00*
No. 1 Busheling	*37.50-46.00*
Machine Shop Turnings	*30.00-30.50*
Forge Flashings	*37.50-46.00*
Short Shovel Turnings	*31.50-35.00*
Cast Iron Borings	34.00-35.00
Punchings & Plate Scrap	*44.00-46.00*

Cast Iron Grades

No. 1 Cupola Cast	59.00-61.00
Heavy Breakable Cast.	48.00-51.50
Clean Auto Cast	62.00-64.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	31.50-32.50
Mixed Borings, Turnings	35.00-36.00
Cast Iron Borings	35.00-36.00
Short Shovelings	35.00-36.00
Low Phos.	47.00-48.00

Cast Iron Grades

No. 1 Cupola	49.00-50.00
No. 1 Machinery	52.00-54.00
Malleable	58.00-60.00

Railroad Scrap

Rails, 2 ft and under.	60.00-61.00
Rails, random size	53.00-54.00
Railroad Specialties	53.00-53.50

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50*
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50*
No. 2 Bundles	28.00-29.00
Mixed Borings, Turnings	25.00-25.50
Machine Shop Turnings	25.00-25.50
Short Shovel Turnings.	26.00-27.00
Punchings & Plate Scrap	39.00-40.00
Low Phos. Plate, 5 ft & under	39.00-40.00
Elec. Furnace Bundles.	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	43.00-44.00
No. 1 Machinery	45.00-46.00
Charging Box Cast	*42.00-43.00*
Heavy Breakable	*42.00-43.00*
Unstripped Motor Blocks	38.00-39.00

* Nominal

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$33.00*
No. 2 Heavy Melt. Steel	*29.50-30.00*
No. 1 Bundles	*33.00*
No. 1 Busheling	*30.00-31.00*
Machine Shop Turnings	25.00
Short Shovel Turnings	*26.50-27.00*
Mixed Borings, Turnings	25.50-26.50
Bar Crops and Plate	*42.00-43.00*
Punchings & Plate Scrap	*42.00-43.00*
Chemical Borings	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Mixed Cast	39.00-40.00
Heavy Breakable Cast.	38.50-39.50
Stove Plate	38.00-39.00

CHICAGO

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Bundles	40.00
No. 2 Bundles	35.00
Machine Shop Turnings	*34.00-35.00*
Mixed Borings, Turnings	*34.00-35.00*
Short Shovel Turnings	*36.00-37.00*
Cast Iron Borings	*36.00-37.00*
Low Phos.	*52.00-54.00*
Elec. Furnace Bundles.	43.00-44.00
Heavy Turnings	*39.00-40.00*
Cut Structurals	*49.00-50.00*

Cast Iron Grades

No. 1 Cupola Cast	*60.00-62.00*
Clean Auto Cast	*60.00-62.00*
No. 1 Wheels	57.00-58.00
Stove Plate	*46.00-47.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-47.00*
Malleable	*70.00-72.00*
Rails, Rerolling	*65.00-66.00*
Rails, Random Lengths	59.00-60.00
Rails, 2 ft. and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Railroad Specialties	*58.00-59.00*
Angles, Splice Bars	*62.00-63.00*

*Brokers' buying price.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$38.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	36.00-37.00
No. 2 Bundles	35.50
Machine Shop Turnings	30.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings.	34.00
Cast Iron Borings	28.00
Bar Crops and Plate.	44.00-45.00
Cut Structurals	44.00

Cast Iron Grades

No. 1 Cupola Cast	54.00
Stove Plate	47.00-48.00
No. 1 Wheels	nominal

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	nominal
Rails, Rerolling	58.00-59.00
Rails, 2 ft and under.	59.00-60.00
Angles and Splice Bars	58.00-59.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*45.00-46.00*
No. 2 Heavy Melt. Steel	*40.00-41.00*
No. 1 Bundles	41.00-42.00
No. 2 Bundles	*38.00-39.00*
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings.	32.00-33.00

Cast Iron Grades

No. 1 Cupola Cast	*60.00-62.00*
Charging Box Cast	*51.00-53.00*
Heavy Breakable Cast	*51.00-53.00*
Brake Shoes	48.00-50.00
Clean Auto Cast	*63.00-64.00*
Burnt Cast	*47.00-49.00*

Railroad Scrap

R.R. Malleable	64.00-66.00
Rails, Rerolling	*61.00-63.00*
Rails, Random Lengths	58.00-60.00
Rails, 2 ft and under	*63.00-64.00*
Uncut Tires	53.00-54.00
Angles, Splice Bars	*61.00-63.00*
Railroad Specialties	55.00-57.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$28.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos. electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	26.50
Rails, Random Lengths	26.50

SEATTLE

No. 1 Heavy Melt. Steel	$28.00
No. 2 Heavy Melt. Steel	28.00
No. 1 Busheling	25.50-26.00
Nos. 1 & 2 Bundles	25.50-26.00
No. 3 Bundles	22.00
Machine Shop Turnings	20.00
Mixed Borings, Turnings	20.00
Punchings & Plate Scrap	37.50-38.00
Cut Structurals	37.50-38.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-42.00
Heavy Breakable Cast.	35.00
Stove Plate	35.00
Unstripped Motor Blocks	33.00-35.00
Malleable	33.00-35.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.00
Railroad Malleable	35.00
Rails, Random Lengths	29.00-30.00
Angles and Splice Bars	29.00-30.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	13.00
Punchings & Plate Scrap	40.00

Cast Iron Grades

No. 1 Cupola Cast	49.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	nominal
Rails, Rerolling	39.50

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast.	45.00

* F.o.b. shipping point.

Sheets, Strip . . .

Sheet and Strip Prices, Page 149 & 150

Cleveland—Rolling mill operations in northern and eastern Ohio were seriously hampered all last week by the blizzard which hit the northeastern part of the country Nov. 24-25. Mill workers were unable to get to their jobs with 20 inches and more of snow bringing transportation to a virtual halt for two days. It was midweek before the mills began to attain anything like normal operations.

Local mills of the American Steel & Wire Co. are estimated to have lost 5000 tons of finished steel, including cold-rolled strip, because of the shutdown caused by the storm. Republic Steel and Jones & Laughlin Steel mills also lost flat-rolled output.

Production lost due to the storm will add to the critical shortage of light, flat-rolled products but of most immediate worry to consumers in the area concerned mill shipments already consigned them. Snow clogged roads, it was feared, might delay shipments urgently needed to support current production schedules under present limited inventory.

Boston—Bookings of rated orders extend through first quarter on some flat-rolled products, notably hot-rolled sheets. An increase in maximum production percentage of the rated tonnage mills may accept on some products is considered likely, flat-rolled included. No civilian volume has been scheduled beyond January and new tonnage for that month is down due to carryovers, rated orders and allocations for essential programs.

New York—While lead time has long since expired, some sheet producers are still in process of working out allocations for January. They have set aside tonnage against DO-rated commitments and programmed work but have not yet set up allotments on non-rated tonnage. They do not anticipate working in any new commercial tonnage in January, but are still uncertain as to how much they can promise for shipment in that month against old commitments. Some describe their order books as being in a "high state of disorder."

Philadelphia—Severe storms in the Pittsburgh, Cleveland and Youngstown districts curtailed sheet shipments to eastern sheet consuming plants and in a few instances slowed fabricating operations.

Pittsburgh—Sheet and strip production schedules did not return to normal until Thursday last week following plant shutdowns the preceding Friday due to unprecedented snowfall. Inability to ship finished steel output by truck or rail was a limiting factor on production. Frazer Corp. has bought into the group running the Whitney-Apollo Steel Co.,

Chicago—Current reversals in the Korean war are dispelling whatever optimism has existed recently that the supply situation for flat-rolled products in first quarter would not be as tight as has been indicated. The outlook for January was admittedly bad because of the absorption of fourth quarter carryover, but hopes had been held for higher acquisitions due February and March.

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all around the yard!

Your biggest opportunity for cost cutting today is in materials handling in yards! You'll find no surer way to yard-wide efficiency than with a P&H Crawler Crane.

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Easier operation and safer handling. You'll have smooth, responsive P&H Direct Acting Hydraulic Control. Working in out-of-the-way places and close quarters . . . save time . . . save money . . . with the P&H simplified method of steering and braking.

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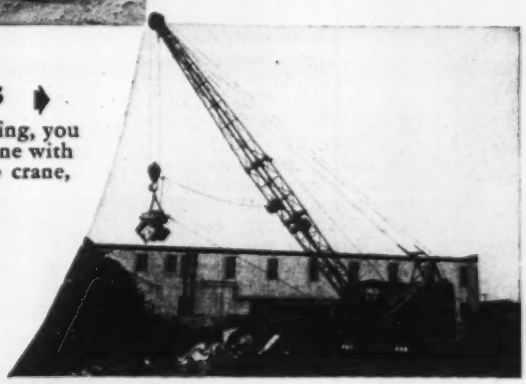
For swifter handling of bulk materials, anywhere in the yard! Not restricted to areas served by trackage. Wide crawlers and all-weather cabs permit year-'round efficient service.



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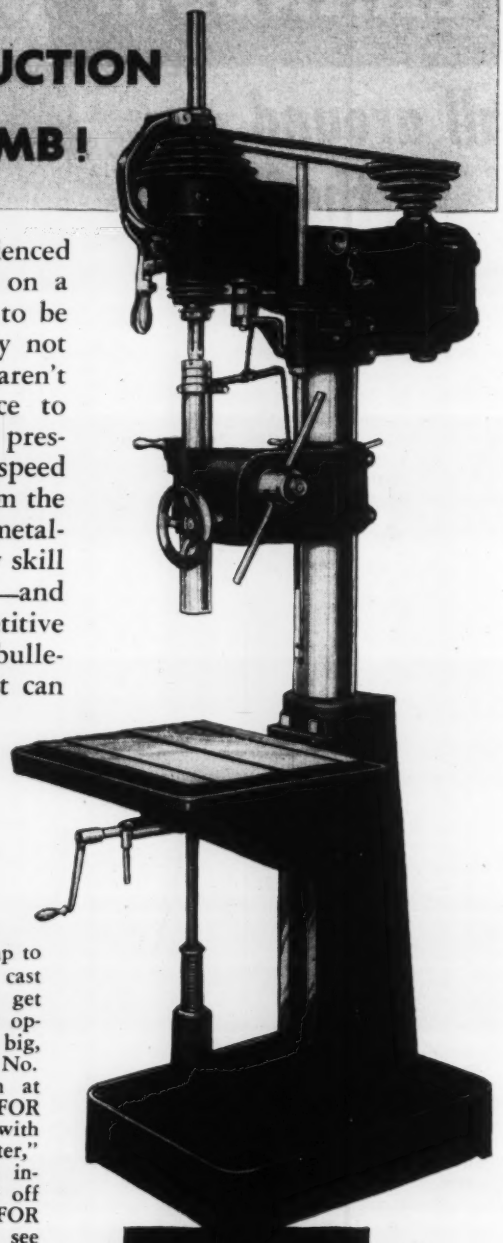


EVEN the most experienced operator can't do his best on a machine that's old enough to be retired on pension! So why not check to make sure you aren't giving valuable floor space to any tool that isn't "up" to present-day accuracy and high-speed standards? Replacement from the complete line of "Buffalo" metalworking tools will lend new skill and speed to your operators—and give you a new competitive "profit edge". Below are bulletins on "Buffalo" tools that can do it for you.

WRITE FOR YOUR FACTS ON DRILLING

If you drill up to 2" holes in cast iron, you'll get easy, smooth operation with the big, rugged "Buffalo" No. 22 Drill shown at right. WRITE FOR BULLETIN 2989-F. Or, with the "Buffalo" "RPMster," you can change speeds instantly without shutting off the motor. WRITE FOR BULLETIN 3257 and see how this can cut your set-up time. And for a rigid, accurate, fast-action drill to handle up to 7/8" holes in cast iron, WRITE FOR BULLETIN 2730-F, on the No. 16 Sensitive Drill.

"Buffalo" METAL WORKING TOOLS

BUFFALO FORGE CO.

158 Mortimer St. Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Steel Bars . . .

Bar Prices, Page 149

New York—Generally speaking hot carbon bar producers have taken no action beyond January, except in the cases of DO orders and programmed tonnage. On DO rated tonnage they have accepted orders several months in advance but on the programmed tonnage nothing beyond first quarter. On hot alloy bars some sellers are booked solidly into March; on cold alloy bars a shade more, on an average. Drawers of cold carbon bars are not only booked up for first quarter in most cases but have accepted some tonnage beyond, which also is true in the case of cold alloy material. Alloy bar sellers are making every effort to get away from the nickel-chrome grades except for defense work.

Boston—Producers of alloy bars are booked on rated tonnage through first quarter to maximum percentage established for these products, but have scheduled no unrated volume beyond January. Rated orders for alloys are somewhat heavier than for carbon with hot-rolled scarce for cold finished on all grades.

Cleveland—Shortage of commercial bars will be further intensified by production lost over the last 10 days as result of operations curtailments because of a blizzard which tied up transportation and generally played havoc with industry in this district. With the mills booked solidly through January and accepting only new DO and other priority tonnage, prospects are bleak for regular customers to augment their meager supplies by placing additional tonnage. Most consumers will be fortunate if they get their curtailed quotas in January considering the rising emergency requirements and the heavy carryover from December. The outlook for possible improvement in general supply conditions after January is darkened by the alarming turn of events in Korea. Setbacks suffered by UN forces is believed certain to step up military procurement, and this means larger tonnages of bars will be earmarked for war goods than had generally been anticipated.

Chicago—Heavy commitments for carbon bars which mills now are carrying include little if any tonnage for shells. The current turn for the worse in Korea likely is hastening the time when institution of a shell program may be a must and this would quickly disrupt the quotas of bars available to civilian consumers.

Plates . . .

Plate Prices, Page 149

Boston — Reductions in unrated plate quotas include lower allocations to integrated fabricating shops. Booked well into first quarter at the maximum 15 per cent on direct rated orders, mill backlogs are expanding with essential program tonnage, openings shrinking for civilian volume.

New York—Except for those having DO ratings or other preferred commitments, such as for freight cars and ore boats, plate consumers are un-

able to obtain mill promises of tonnage for shipments beyond January. Consumers are unable to obtain sufficient steel to maintain even normal operations, to say nothing of abnormal production necessary in meeting current consumer requirements.

Chicago—Plate fabricators are receiving only 60 to 70 per cent of their plate requirements and each month sees a worsening in the situation. Jobs in process are frequently held up to await arrival of required sizes in new shipments. Plate shops normally do not inventory much plate because of costly handling and storage.

Tin Plate . . .

Tin Plate Prices, Page 150

Pittsburgh—Tin plate operating schedules got under way on a limited basis last Wednesday and Thursday after facilities were shut down since the preceding Friday because of adverse weather conditions. Output of tin mill products in the Wheeling-Weirton area fared better than here. Extra schedules on tin mill products are not expected to be announced until this week.

Cleveland—Expectations are other producers will follow the lead of U.S. Steel Corp. subsidiaries and advance prices on tin mill products for 1951. However, up to late last week Republic Steel Corp. had taken no formal action. The U.S. Steel advance, which becomes effective Jan. 1, averages about 12 per cent.

Birmingham—Tennessee Coal, Iron & Railroad Co. has announced a general increase on tin plate occasioned, the company said, by increased production costs. The company is now quoting coke tin plate for 1951 at $8.55; electrolytic, $7.25; special coated manufacturing ternes, $7.60 and black plate, $6.35.

Los Angeles — Construction of Kaiser Steel Corp.'s Fontana tin mill will start in January. Operation is scheduled for January, 1951.

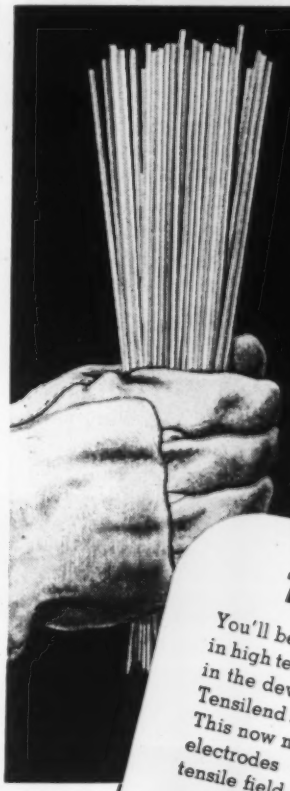
Tubular Goods . . .

Tubular Goods Prices, Page 152

Boston—Steel pipe allocations are not sufficient to cover utilities' requirements for lead-ins for natural gas distribution, estimated at approximately 35,000 tons, mostly 6 to 10-in. Numerous gas companies are inquiring for potential tonnage, depending on distance from main distributing lines. Allocations of pipe to distributors for January hold near recent monthly levels, but reductions are expected for February. Numerous distributors failed to take May or June quotas this year which will be reflected in lower tonnages for some under M-6 warehouse order based on the first nine months' shipments.

New York—While pipemakers continue to sell distributors on a monthly basis, some are now opening their books for first half on direct consumer shipments. There are indications, however, that direct consumers will get substantially less tonnage than in first half of this year.

Birmingham—Production was resumed Nov. 28 at the plant of the American Cast Iron Pipe Co. here



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Special stainless type coatings; baking and packing to reduce moisture absorption after delivery; and other rigid quality controls assure you of "high-test" performance in the shop and in the field. There's no need for preheating (even in heavy sections) and underbead cracking has been eliminated. If you run up against any problems in welding high strength steels, we'll be glad to give any help we can.

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High Tensile Steels

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Good News —

NOW, all Johnson XLO Music Spring Wire is made from imported, improved Swedish rod. Johnson researchers plus the resources of Swedish steelmakers have developed an electric furnace steel, with closely controlled analysis, which is being used exclusively in Johnson Music Spring Wire. The result—more uniformity and added fatigue.

This quality advance is in line with the Johnson policy of giving something better whenever possible.

Ample stockpiles warrant a continuous supply.

JOHNSON

STEEL AND WIRE COMPANY, INC.

WORCESTER 1, MASS.

New York Philadelphia Cleveland Detroit Akron Chicago

Atlanta Houston Tulsa Los Angeles Toronto

after one day suspension because of adverse weather.

Strike of United Steelworkers of America at the McWane Cast Iron Pipe Co. now is in its eighth week.

Pittsburgh — Output of tubular products was well sustained last week in contrast to that of other finished steel items.

Wire . . .

Wire Prices, Page 151

Cleveland—Production losses resulting from operations curtailments occasioned by last week's blizzard will further tighten wire product supply conditions. Local plants of the American Steel & Wire Co. lost 5000 tons of finished products, including wire, wire products and cold-rolled strip because of the storm. Other district wiremakers lost considerable production.

Boston—Rod supply is tightening with more finishing mills adjusting schedules to available supply. Revisions in finishing schedules will include changes for February when production programs for that month are determined. Heavier volume of rated orders is usually of secondary nature involving screws, spring assemblies and parts needed for prime contracts.

Climax Molybdenum Prices Up

New York—Effective Dec. 1, Climax Molybdenum Co. increased all regular product prices 10 cents per pound. New prices, on basis of dollars per pound of Mo contained, plus cost of containers f.o.b. Langeloth, Pa., are: Bagged molybdic oxide, $1.13; technical molybdic oxide, $1.14; molybdic oxide briquettes, $1.14; canned molybdic oxide, $1.14; calcium molybdate, $1.15; pure molybdic oxide, $1.35; ferromolybdenum, $1.32. Molybdenite concentrate is now $1 f.o.b. Climax, Colo. Prices for molybdenum sulphide, special grades, are: Selected molybdenite concentrate, $1.07 per pound of Mo contained; specially treated molybdenite concentrate, $1.05 per pound gross (50 pound minimum); purified molybdenum sulphide, $1.55 per pound gross (50 pound minimum).

Structural Shapes . . .

Structural Shape Prices, Page 149

New York — October structural bookings of 233,922 tons were off 17,133 from the preceding month, according to the American Institute of Steel Construction, and brought bookings for the first 10 months to 2,057,276 tons, 71 per cent greater than for the corresponding period of 1949 and highest since 1930, when 2,385,600 were reported for the 10-month period.

Shipments last month of 167,693 tons showed an increase of 7 per cent over September and were 68 per cent greater than shipments in October, 1949. Shipments for the 10 months totaled 1,573,268 tons, slightly under the 1,600,856 shipped in the same period of the previous year. Backlogs for the next four months only, as of Nov. 1, increased to 764,878 tons.

Philadelphia—Eastern shape mill

operations were little affected by weather but the tie-up in Pittsburgh due to heavy snow storms curtailed shipments to eastern fabricating shops. Inventories are shrinking. DO rated tonnage has been small to date.

Seattle — The supply situation is worsening and smaller fabricators are cautious in making commitments.

Semifinished Steel . . .

Semifinished Prices, Page 149

Cleveland — Local district steelworks recovered rapidly last week from the shutdown occasioned over the preceding weekend by the blizzard which paralyzed industrial operations throughout northern and eastern Ohio. Considerable production was lost by the banking of blast furnaces, and the closing down of openhearths from one to four days.

Last midweek Republic Steel Corp. was operating nine out of 15 openhearths and expected its local plant would average 75 per cent operations for the week. Jones & Laughlin's works was back to 50 per cent steelworks operations on Tuesday and indicated it would operate 100 per cent before end of the week. American Steel & Wire Co. estimated the storm cost loss of 3000 tons of pig iron and 5000 tons of finished steel products.

Pig Iron . . .

Pig Iron Prices, Page 148

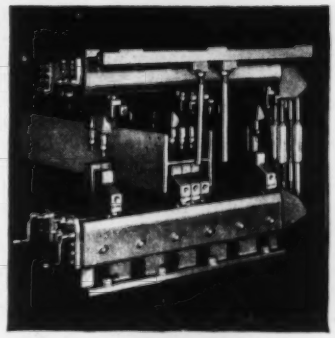
Cleveland—Large tonnage of pig iron was lost in this district last week because of blast furnace curtailments due to the blizzard which struck throughout northeastern United States. For almost two full days industry in this city was virtually halted with transportation at a standstill in 20 inches of snow.

By last midweek blast furnaces were getting back into full production. American Steel & Wire Co. lost 3000 tons of iron when it cut the wind on its two stacks. Republic Steel, which has five stacks, took the wind off four furnaces for three days, but by last midweek was again operating all four. Its fifth stack has been down for repairs for more than a month. Jones & Laughlin banked one of its two stacks, but was operating both by last midweek.

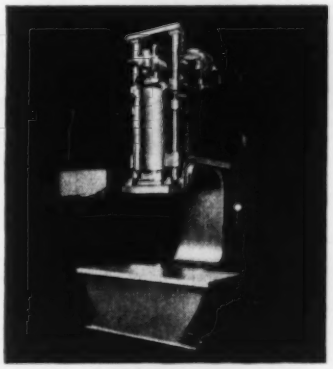
To what extent foundry pig iron shortage would be further intensified by the blast furnace curtailments is uncertain. Foundries in this immediate territory were forced to close because of the storm but by last midweek were resuming production.

Boston — With relatively little foundry pig iron coming from Buffalo and other outside points, mostly in scattered carlot shipments, Mystic production is being absorbed without serious shortages apparent. Several of the larger melters have built up inventories. Melt tends upward for machine tools and textile mill equipment. Latter shops have backlogs extending well into next year. Foreign arrivals, mostly basic are heavier, approximately 10,000 tons latter half of November.

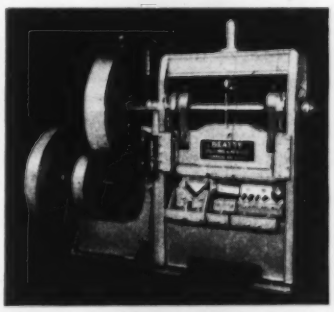
New York—District pig iron consumers are placing more orders for foreign iron in an effort to augment domestic supply. The general market



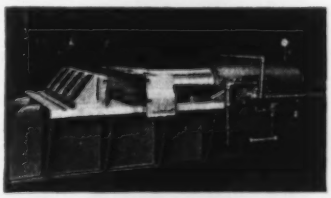
BEATTY Adjustable Tools punch webs of beams and channels, legs of angles and plates.



BEATTY 250-Ton Gap Type Press for forming, bending, flanging, pressing.



BEATTY Guillotine Bar Shear for "short order" shearing without changing tools.



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.

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There is a better way to handle most production problems, and our engineers are dedicated to finding that better way. If you have a problem, write us. We have the answer.

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BEATTY MACHINE AND MFG. COMPANY
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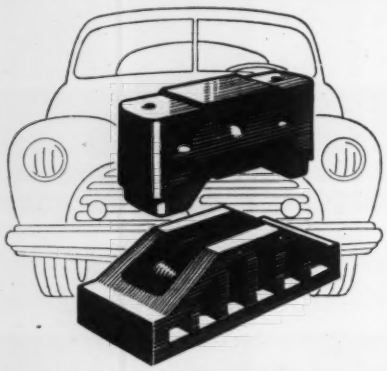

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Easy machinability compared with steel, capacity to take a high polish in work, toughness to resist pressing stresses, and above all ability to resist abrasion—these qualities denote a good forming die.

The use of Molybdenum in cast iron dies has now become standard practice, because it most economically attains these desirable properties.

One of the suitable compositions is: 3.40% Total Carbon, 1.40% Silicon, 0.80% Manganese, with 0.25% Chromium, 0.10% Vanadium and 0.50% Molybdenum added.

This composition is one of many listings under "Dies" in our "Applications of Molybdenum Cast Irons"—an alphabetically arranged ready-reference booklet for busy foundrymen and for engineers—write for it!

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MOLY

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for imported iron of reliable grade is around $58-$60, duty paid, deliveries falling in late January and beyond.

Pittsburgh—Pig iron output was back to nearly normal by last midweek, following banking of furnaces the preceding Friday and Saturday due to adverse weather. Carnegie-Illinois has refired its No. 3 furnace at the Isabella plant for production of feromanganese.

Chicago—At the close of November, 41 of the district's 42 blast furnaces were in operation, as compared with 40 blowing at end of October. Youngstown Sheet & Tube Co. returned its South Chicago No. 4 stack to activity on Nov. 2 after 18 months' idleness for modernization and relining. The 41 active furnace rate was attained in only two months of 1950, namely, July and November.

Rails, Cars . . .

Track Material Prices, Page 151

Birmingham—Gulf, Mobile & Ohio has authorized purchase of $8 million worth of cars, consisting of 700 box cars, 300 gondolas and 400 ore cars.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Cincinnati—Demand for foundry coke exceeds supply. Oven interests note conditions are somewhat changed from those at the opening of World War II. Then considerable unused facilitities for beehive coke gave an immediate lift to total output. Now such expansion to any great degree is impossible today due to deterioration of some beehive ovens and failure to replace them.

Chicago—Foundry coke suppliers report shipments approximately 60 to 70 per cent of demand yet no foundries have been forced to shut down because of fuel depletion. Supply is on a hand-to-mouth basis since inventories vanished some time ago.

Scrap . . .

Scrap Prices, Page 156

Pittsburgh—Movement of scrap to Pittsburgh mills was at a virtual halt most of last week due to bad weather. Mills' stocks are in good shape for the next few weeks but the supply situation throughout the winter months is expected to present a serious problem. Mills generally are sticking to formula prices but some have been increasing the springboard allowance on freight. There also is increasing evidence of upgrading.

Boston — Most deals for No. 1 heavy melting steel over the formula prices are for premium scrap, but the trend is firmer with spread quotations for that grade eliminated. Bundles are strong with No. 1 bundles $1 higher. Dollar spread continues for No. 2 heavy melting and pricewise that grade is steadier than No. 1. Cast grades are for the most part unchanged, district foundries buying less with better inventories.

New York—Brokers' buying prices are unchanged on steel grades, but $2 higher on charging box and heavy breakable cast. Power failures, due to high winds, curtailed the movement of scrap in this area last week.

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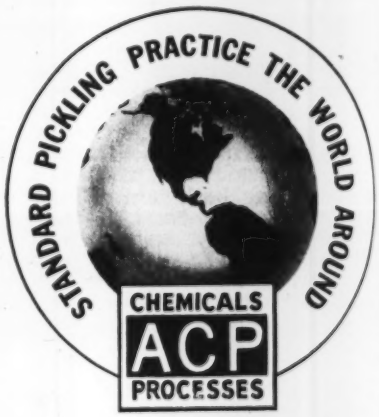


For Improved Drawing and Cold Forming . . .

"Granodraw" forms on pickled surfaces a tightly bound adherent, zinc-iron phosphate coating which facilitates the cold extrusion of steel, improves drawing, and lengthens die life.

"Cuprodine" coats both carbon and stainless steels with a thin, bright, adherent layer of copper. This coating prolongs die life and improves the drawing of wire, rod and tubing.

Write for Descriptive Folder

American Chemical Paint Co.
AMBLER ACP PENNA.

Philadelphia — Formula prices on steel scrap are being subjected to severe pressure, with consumers from outside the district offering higher levels. However, little new buying has developed here. Adding to the strength of the market are delays in shipments due to recent storms.

Buffalo—Top mill consumer in this area notified the scrap trade that it does not intend to break away from the formula price schedule at this time. One leading dealer pointed out that he doubted whether the mill would receive any more scrap than it is getting at the present time, even if it did hike prices. Smaller users continue to buy at higher levels.

Detroit—Material, aside from that which is allocated and continues to move at no higher than "formula" prices, has surged upward again, sales being run up at levels $3 higher than last week for bundles. Only items which seemed to have reached a plateau are cast grades, and foundry resistance to the asking prices has stiffened. It is estimated 95 per cent of all open hearth scrap is controlled by the formula, but the other 5 per cent is running wild under the stimulus of high demand.

Cleveland—Movement of scrap in this district was practically at a standstill from Nov. 25 through Nov. 29 due to snow-blocked roads. Yards began sending out their trucks on Thursday and expect to be in full operation by Dec. 6. Consuming plants stepped up their operations more quickly than did their receipts of scrap, requiring a heavy withdrawal from reserve stocks. This strengthened the undertone of the market.

St. Louis—After a week of stability, scrap prices started climbing again last week. Melting steel rose $1 to $3.50 as a number of mills reentered the market to strengthen already good inventories against a cold weather decline in shipments. Sheffield at Kansas City bought a substantial tonnage of No. 2 at $45 to $46. Two Kokomo, Ind. mills which rarely buy in this area, also placed orders.

Steel Prices Go Up

(*Continued from page* 67)

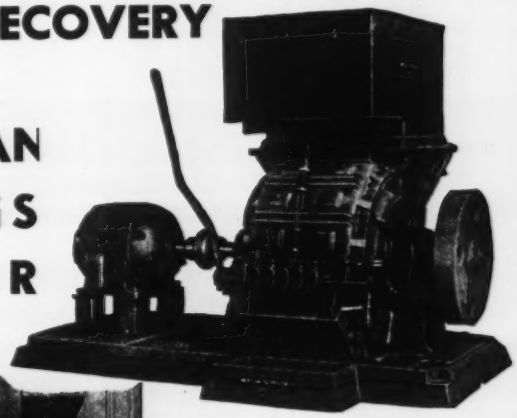
became effective with shipments made on and after 12:01 a.m., Dec. 1, 1950.

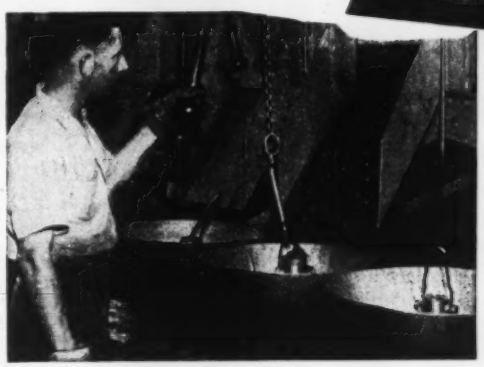
Prices are subject to seller's lists of extras and deductions and standard conditions of sale in effect at time of shipment.

All sales are subject to seller's prices in effect at time of shipment.

	(cents per pound unless otherwise denoted)	Increase dollars per ton
Wire rods, carbon		
Donora, Cleveland and Joliet	4.10	$5.00
Worcester	4.40	5.00
Cold rolled carbon strip		
Cleveland	4.65	10.00
New Haven	5.15	10.00
Wire—mfgrs. bright, low carbon		
Cleveland, Donora, Joliet, Duluth, Rankin and Waukegan	4.85	7.00
Worcester	5.15	7.00
Spring wire—high carbon		
Cleveland, Donora, Duluth and Waukegan	5.90	...
New Haven, Trenton and Worcester	6.20	...
Nails and staples		
Donora, Duluth, Joliet, Rankin	Column 118	$12
Worcester	Column 124	$12

CUTTING-OIL RECOVERY can pay for an AMERICAN TURNINGS CRUSHER





Reducing long, curly turnings of steel, alloys, brass, aluminum, etc., to uniform chips—with an American Turnings Crusher — increases cutting oil reclamation to 30-50 gallons per ton!

The higher scrap value of short shovel chips . . . and the savings in storage and handling too—these are additional reasons why Americans buy themselves . . . again and again!

Segregated turnings are reduced to uniform chips by an American Shredder Ring Crusher for highest cutting oil recovery at the Crown Cork and Seal Co., Baltimore.

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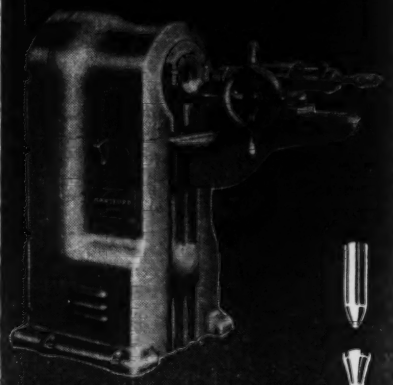
EUCLID CRANES AND HOISTS *Raise Profits*

HARTFORD SPECIAL
SWAGERS
save time and material on turning operations



Hartford Special Swagers feature hardened and ground liners in die slot of spindle for longer wear of operating parts. All swagers equipped with stop rods to assure even opening of die along entire length.

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Wire—merchant quality	Annled Price	Up	Galvd Price	Up
Cleveland, Donora, Duluth, Joliet and Rankin	5.70	$7.00	5.85	$7.00
Worcester	6.00	7.00	6.15	7.00
Wire—barbed				
Donora, Duluth, Joliet, Rankin	Column 140*			$16
Woven fence				
Donora, Duluth, Joliet, Rankin	Column 130*			$16
Bale ties				
Donora, Duluth, Joliet	Column 123			$10

** These prices take into effect the current price of 17.50c for zinc.*

National Tube Co.

National Tube Co., subsidiary, United States Steel Corp., announced the following increases in mill prices:

Products	Dollars per net ton
Buttweld pipe, black and galvanized, plain end	$ 8
Buttweld pipe, black and galvanized, threads and couplings	9
Seamless pipe 2 in. to 4 in., black and galvanized, plain end	12
Seamless pipe 2 in. to 4 in., black and galvanized, threads and couplings	13
Seamless pipe above 4 in., black and galvanized plain end	7
Seamless pipe above 4 in., black and galvanized, threads and couplings	8
Oil country casing—all grades	8
Oil well tubing—all grades	13
Drill pipe—all grades	13
Seamless and welded, carbon and alloy, mechanical and pressure tubing	average 6½ per cent

T. C. I. & R. R. Co.

Tennessee Coal, Iron & Railroad Co.'s new prices are as follows: All prices quoted are in cents per pound unless otherwise denoted.

Forging, billets, blooms, slabs $66 net ton.
Rerolling billets, blooms and slabs $56 net ton.

Wire rods	4.10
Hot rolled sheets (18 gage and heavier)	3.60
Cold reduced sheets	4.35
Galvanized sheets, regular, 10 gage	4.80
Culvert 16 gage copper bearing	5.60
Bars and small shapes	3.70
Reinforcing bars	3.70
Plates, carbon	3.70
Standard shapes	3.65
Standard Rails	3.60
Light rails	4.00
Splice bars	4.70
Tie plates	4.50
WIRE MILL PRODUCTS	
Bright low carbon wire	4.85
Nails and staples	Col. 118
Wire, merchant quality	Annealed 5.70 Galvanized 5.95
Barbed wire	Col. 140*
Woven fence	Col. 130*
Bale ties	Col. 123

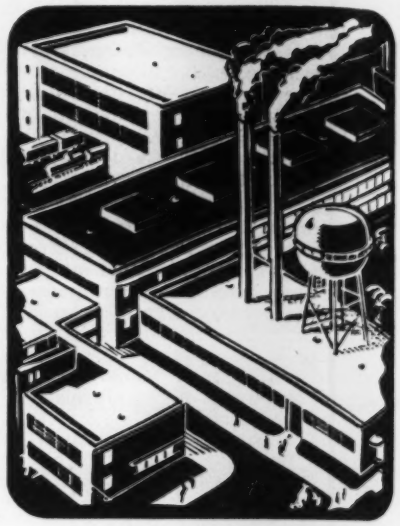
** These prices take into effect the current price of 17.50c for zinc.*

HIGH STRENGTH STEEL PRODUCTS	
U. S. S. Corten	
Hot rolled sheets	5.40
Bars and small shapes	5.55
Plates	5.65
Standard structural shapes	5.50

Columbia Steel Co.

New prices quoted by Columbia Steel Co., Pittsburgh and Torrance, Calif., are as follows: All figures are cents per pound unless otherwise denoted.

CARBON STEEL PRODUCTS	Pittsburgh	Torrance
Standard Structural Shapes		4.25
Bars	4.40	4.40
Reinforcing Bars	4.40	4.40
Tie plates	4.65	4.65
Hot rolled sheets 18-gage and heavier	4.30	4.30
Hot rolled annealed sheets 19 gage and lighter		5.40
Well casing sheets		5.10
Galvanized sheets	5.55	5.55
Culvert 16-gage copper bearing	6.35	6.35
Cold rolled sheets	5.30	



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Competition has been a delightful companion to Layne for years and years, and best of all it has been a wonderful guide in showing hundreds of things NOT TO DO in building dependable well water systems.

Layne offers all industries, cities and users of ground water in big quantities, a wholesome record of fine service not equaled by any other well drilling or pump building firm in the entire world. No other organization can match Layne's record of dependability in their chosen field.

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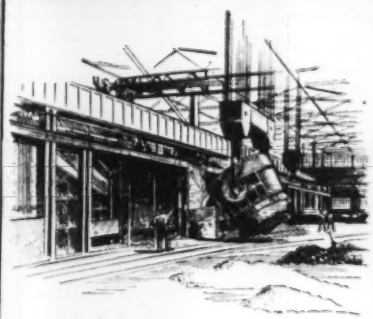

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JEBCO PRODUCTS SINCE 1889 — 61 YEARS OF SERVICE

Wire rods, hot rolled	4.75	4.90
Wire annealed merchant quality	6.65	6.65
Wire galvanized merchant quality	6.80	
Wire bright basic	5.80	5.80
Wire MB high carbon spring	7.20	
Wire premier spring	6.85	6.85
Nails and staples non-stock	6.90	
Nails and staples stock	Col. 137	Col. 138
Barbed and twisted wire	Col. 156*	
Woven wire fences	Col. 149*	
Bale ties single loop	Col. 147	

** These prices take into effect the current price of 17.50c for zinc.*

HIGH STRENGTH STEEL PRODUCTS

U.S.S. Manten sheets	5.15

Geneva Steel Co.

New prices quoted by Geneva Steel Co., Geneva, Utah, follow:

CARBON STEEL PRODUCTS	cents per lb.
Plates	3.70
Standard Structural shapes	3.65
Hot-rolled Sheets	3.70
HIGH STRENGTH STEEL	
U. S. S. Corten plates	5.65
U. S. S. Manten plates	4.75
Abrasion resisting plates	4.85

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1890 tons, First Avenue tunnel, at 41st street, in connection with United Nations development, New York, to American Bridge Co., Pittsburgh.

375 tons, Wesson Maternity Hospital, Springfield, Mass., to Haarmann Steel Co., Holyoke, Mass.

360 tons, state bridge, Onondaga county, New York, to Bethlehem Steel Co.

360 tons, plate weldments for foundation work, Union Carbide & Carbon Co., Marietta, O., to Bethlehem Steel Co.

250 tons, junior high school, Abington, Mass., to West End Iron Works, Cambridge, Mass.; Park Construction Co., Boston, general contractor; Joseph T. Ryerson & Son Inc., Cambridge, reinforcing steel.

220 tons, West Side junior high school, Brockton, Mass., to West End Iron Works, Cambridge, Mass; Platt Contracting Co. Inc., Cambridge, general contractor.

180 tons, school buliding, Manchester, Mass., to West End Iron Works, Cambridge, Mass.; Walsh Construction Co., Salem, Mass., general contractor; U. S. Steel Supply Co., Boston, reinforcing steel.

175 tons, towers, Consolidated Light & Power Co., Waterbury, Conn., to Blaw-Knox Co., Pittsburgh.

135 tons, 110-foot composite steel girder bridge, Putnam, Conn., to American Bridge Co., Pittsburgh; Jones Construction Co. Inc., Columbia, Conn., general contractor.

120 tons, shapes and bars, state highway bridge, Acton-Concord, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Peter Salvucci, Waltham, Mass., general contractor.

105 tons, state highway bridge, New Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; C. W. Blakeslee & Sons, New Haven, general contractors.

100 tons or more, buildings, Zelatrius of the Sacred Heart convent, Hamden, Conn., to Topper & Griggs, Hartford, Conn.; Mott-Mohr Construction Co., New Haven, general contractor; Fox Steel Co., New Haven, reinforcing steel.

STRUCTURAL STEEL PENDING

3700 tons, first unit of 15,000-ton project, galvanized steel transmission towers; bids in to Bonneville Power Administration, Portland, Oreg.

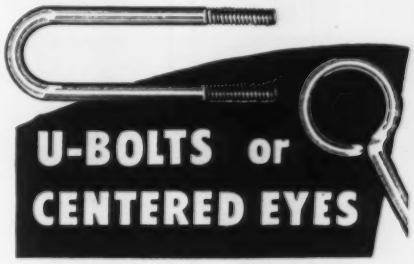
1885 tons, including 950 tons silicon structural steel, 4-span deck girder bridge, Housatonic river, Newton-Southbury, Conn.; Mariani Construction Co., New Haven, Conn., low on general contract; also 910 tons steel piles.

1068 tons, state bridge, Montgomery county, Pennsylvania; bids Dec. 27.

1000 tons, power plant, Elelson Air Field, Alaska; bids in to U. S. Engineer.

606 tons, state highway bridge, Lehigh county, Pennsylvania, bids Dec. 27.

500 tons, contract No.66, New Jersey turnpike bridges, Elizabeth, N. J.; bids Dec. 5. Also required are 5500 feet of driving steel bear-



U-BOLTS or CENTERED EYES
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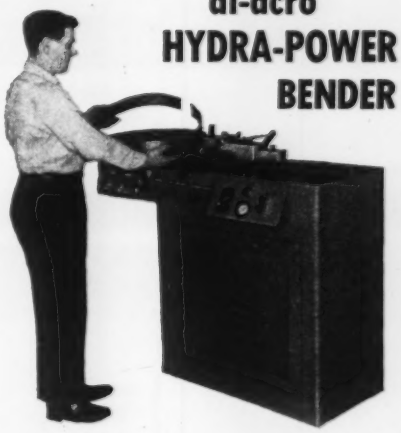

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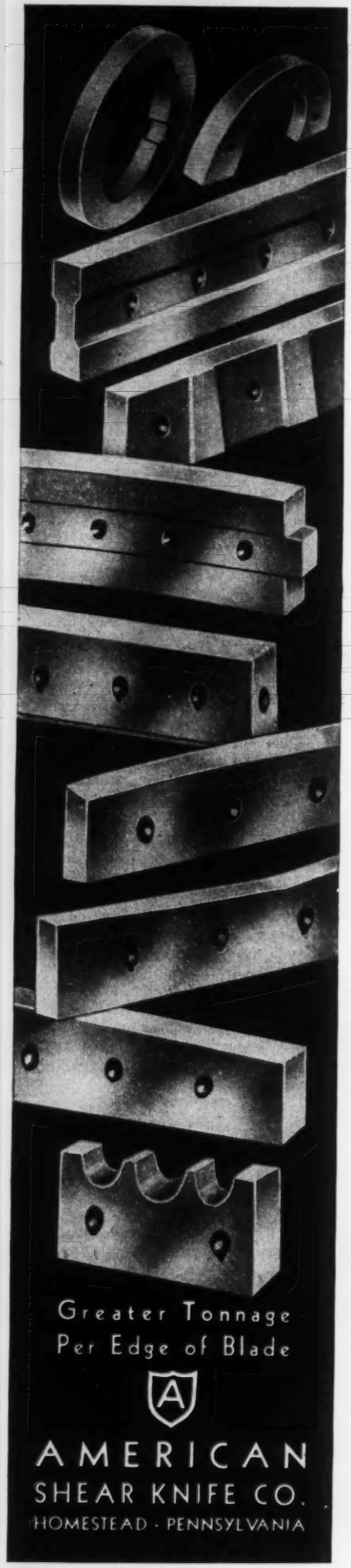


ing piles and 227 tons of steel piling, order for which has been placed.

500 tons, public library, Providence, R. I.; E. Turgeson Construction Co., Providence, low on general contract.

385 tons, 3-span continuous WF beam bridge, Berkshire, Vt.; Oscar L. Olson, Montpelier, Vt. low on general contract.

250 tons, 163-foot 3-span continuous rolled beam bridge, Darien, Conn.; Paul Bacco & Son Inc., Stamford, Conn., low on general contract.

250 tons, Bureau of Public Roads bridge, Coeur d'Alene river, Idaho; Poole, McGonigle & Dick, Portland, Oreg., low, $70,693, and recommended.

125 tons, two Montana state highway bridges, Yellowstone and Dawson counties, bids to Helena, Dec. 1.

Unstated, steel towers and other facilities naval communications station, near Arlington, Wash.; bids to 13th. District, Seattle, Jan. 19.

Unstated, steel frame warehouse, McNary dam; bids to U. S. engineer, Walla Walla, Wash., Jan. 10.

REINFORCING BARS . . .

REINFORCING BARS PLACED

230 tons, West Side junior high school, Brockton, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; Platt Contracting Co. Inc., Cambridge, general contractor.

100 tons, branch bank building, Yakima, Wash., for Seattle First National Bank, to Northwest Steel Rolling Mills Inc., Seattle; general contract to General Construction Co., Seattle, $526,860.

REINFORCING BARS PENDING

525 tons, state bridge, Montgomery county, Pennsylvania; bids Dec. 27.

228 tons, state highway bridge, Lehigh county, Pennsylvania; bids Dec. 27.

130 tons, New Jersey turnpike bridges, Elizabeth, N. J.

100 tons, two state highway bridges; bids to Helena, Mont., Dec. 1.

PLATES . . .

PLATES PLACED

2000 tons, tanks, Shell Oil Co., New York, to Ellerbee Bros., Houston, Tex.

PLATES PENDING

2000 tons, penstock liners Ross dam; bids in to Seattle.

Unstated, tanks for bulk fuel storage, Elmendorf Field, Alaska; bids Dec. 20.

Unstated, unstated projects, Hanford, Wash.

PIPE . . .

CAST IRON PIPE PENDING

2855 tons, 6 to 24-inch mechanical joint with 910 tons cement lined, Washington Suburban Sanitary Commission; bids Dec. 11. Also required are 300 tons of mechanical joint fittings.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Louisville & Nashville, 62 diesel-electric locomotive units; contracts placed.

Pacific Great Eastern, six 1600-hp, diesel-electric units, to Montreal Locomotive Works, Montreal, Que.

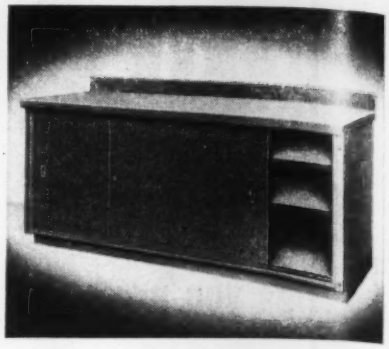
RAILROAD CARS PLACED

Chicago & Eastern Illinois, 25 seventy-ton covered hopper cars, to Thrall Car Mfg. Co., Chicago Heights, Ill.

Georgia, 150 freight cars; 100 fifty-ton high-side gondolas to American Car & Foundry Co., New York, and 50 seventy-ton hopper cars to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

Buffalo Creek, 1000 box cars, award expected shortly; the railroad is jointly owned by Erie and Lehigh Valley, and they, as lessees, will provide payments on the new equipment under a conditional sales agreement.



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OVER 47 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

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FERROALLOYS

(*Continued from page 153*)

Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.35c per lb of contained Cr, 0.04% C 31.25c, 0.06% C 30.25c, 0.10% C 29.75c, 0.15% C 29.50c, 0.20% C 29.25c, 0.50% C 29.0c, 1% C 28.75c, 1.50% C 28.60c, 2% C 28.5c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S MxD, bulk, 23.25c per lb of contained Cr, c.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, Carload, packed, S MxD, 16.10c per lb of alloy; 1 ton 16.95c; less ton lot, 18.15c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.00c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.0c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium, ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.75 per lb of contained W; 2000 lb W to 10,000 lb W, $2.85; less than 2000 lb W, $2.97. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $3.65 per lb of contained W; less than 1000 lb W, $3.75.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 19.00c per lb of contained Si; packed 20.40c; ton lot 21.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.0c per lb of contained Si, carload packed 13.6c, ton lot 15.05c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered, Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 15.55c per lb of contained Si, carload packed 16.8c, ton lot 17.8c, less ton 18.95c. Delivered, Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.65c per lb of alloy, ton lots packed 10.05c, 200 to 1999 lb 10.40c, smaller lots 10.90c.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 21.0c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.).

Why not use Perforated Metal?

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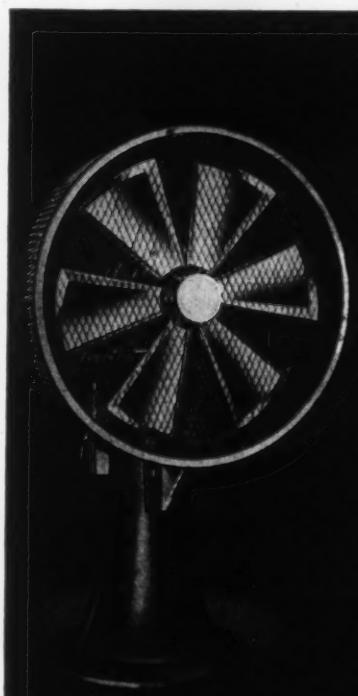

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TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.00 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.10. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.20.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, delivered; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

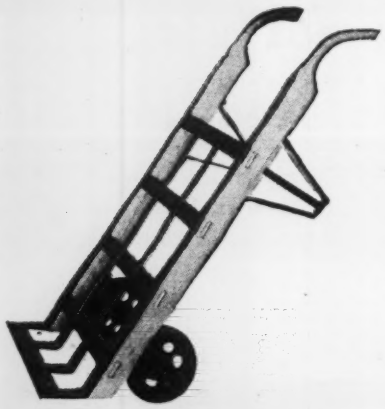
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8 11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

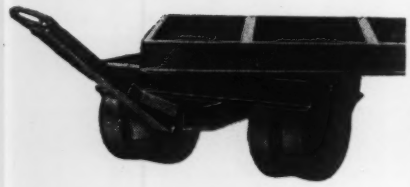
Ferrophosphorus: (23-25% based on 24%, P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.22; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.04, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.



Trucks and Trailers



up to 50 ton capacity

Built with 80 years of skill by pioneers in the industry. Over a hundred standard two, four, and fifth wheel trucks and trailers. Special units designed and built to your specification. Complete engineering service.

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Good fasteners cost little why pay less?

The REAL cost of a fastener is in terms of the final product cost.

But some people *will* cut corners on that small *first* cost—and end up with a whopping *big* cost in assembly.

Why take a chance on an inferior fastener?

Scovill Makes Good Fasteners

A PRODUCT OF SCOVILL

Recessed Head Screws • Sems
Tapping Screws • Standard
Machine Screws • Special Cold Headed Parts

SCOVILL FASTENERS

Industrial Fastener Sales, Waterville Division
Scovill Manufacturing Co., Waterville 14, Conn.

Montclair, N. J. • Detroit • Wheaton, Ill.
Los Angeles • Cleveland • San Francisco

Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

Arizona

McConkey-Docker & Co., Phoenix, Ariz., is authorized as a distributor for Carboloy Co. Inc., Detroit. This appointment was made as a result of heavy demand by the metalworking industries for tools that will increase production per machine hour. Carboloy standard tools, standard blanks, carbide tipped masonry drills, and diamond impregnated carbide wheel dressers will be carried in stock by McConkey-Docker for fast delivery to users in Arizona.

California

Modern Metal Spinning & Mfg. Co., Los Angeles, doubled factory space by addition of a new branch plant. Parts for the aircraft industry including aircraft hardware are manufactured.

California

Hi-Shear Rivet Machine Co., Long Beach, Calif., started construction of a plant at the Los Angeles International Airport industrial tract. Completion is scheduled by January.

California

Vard Inc., Pasadena, Calif., started construction of a plant in that city where it will continue manufacture of aircraft and other instruments. Operations are scheduled to start by January.

California

Sierra Tool Mfg. Co., Glendale, Calif., opened a plant for production of aircraft parts. E. Hamer is president of the firm.

California

Diversified Metal Products, Los Angeles, formed to manufacture machine tools, aircraft parts, and to perform hydraulic duplicating work.

California

Los Angeles Department of Water & Power will construct a $58 million steam power plant of 400,000 kilowatts capacity. To increase electric generating capacity of the Los Angeles district by 50 per cent, the new plant will be built on a 22-acre site in Seal Beach.

Illinois

Marquette Cement Mfg. Co., Chicago, is contemplating a substantial addition to its cement manufacturing plant in that city. Several additional kilns and other facilities may be added.

Illinois

Laclede-Christy Co. moved its executive, fiscal and operations offices to 310 S. Michigan Ave., Chicago 4. Headquarters of the company were formerly in the Ambassador Bldg., St. Louis. The general sales office is located in the Iroquois Bldg., 3600 Forbes St., Pittsburgh. D. N. Watkins is president; J. L. Cummings, vice president and director of sales. Laclede-Christy makes fire clay and glass industry refractories, also sewer pipe.

Iowa

Air Reduction Sales Co., New York, a division of Air Reduction Co. Inc., appointed S. J. Smith Co., Davenport, Iowa, an authorized dealer of Airco products. The new dealer will service Scott county in Iowa and Rock Island county in Illinois with a complete line of Airco gas and electric arc welding equipment, supplies and accessories.

Louisiana

Neil Loynachan, general manager, **Fiber and Twine Division,** International Harvester Co., Chicago, announces work is to start immediately on a $2 million twine mill and office building in New Orleans.

Maryland

Philco Corp., Philadelphia, plans construction of a $1 million television tube plant.

Maryland

Cambridge Wire Cloth Co., Cambridge, Md., appointed the following new distributors for its line of gripper woven wire slings: City Wire & Iron Works, Los Angeles; Plant Equipment Co., Denver; Cameron & Barkley Co., Miami, Fla.; Borne Co., Covington, Ky.; Robert L. Schmitt Co., Louisville; Tool Supply Co., Detroit; Rapids Handling Equipment Co., Buffalo; Mahoning Valley Supply Co., Youngstown; Hays Supply Co., Memphis, Tenn.; Industrial Supply Co. Inc. and National Equipment Co., Salt Lake City, Utah.

Minnesota

United States Air Conditioning Corp., Minneapolis, appointed Jose Salvat & Co. Ltda., Barranquilla, Colombia, as its exclusive representative and

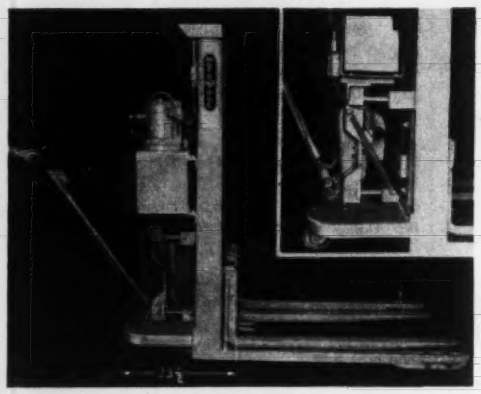
ANACONDA
FERROMANGANESE
standard grade
ANACONDA
NODULIZED MANGANESE ORE
Manganese content approximately 59%
Anaconda's production is the principal U. S. source of supply for metallurgical grade manganese ore. Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y., and Anaconda, Montana.
60378
ANACONDA
COPPER MINING COMPANY

The Shortest Hi-Lift

MOTORIZED, BATTERY OPERATED

WALKIE TYPE TRUCK Built

DUE TO MOST COMPACT POWER UNIT



"SHORTIE" MODEL MOTO-TRUC TELESCOPIC HI-LIFT TRUCK

Patented articulating hinged spring unit holds drive wheel down on floor.

Standard capacities: 3,000 and 4,000 pounds. Lifting heights from 80" to 120".

The MOTO-TRUC Co.
1943 E. 59th Street
CLEVELAND 3, OHIO.
Originators and world's largest exclusive manufacturers of motorized, battery operated walkie type trucks

HI-LIFT, PALLET, PLATFORM TRUCKS.

15" TO 20" SHORTER than other trucks of this type.

STACKS PALLETS FROM NARROWER AISLES, permits more space for storage.

EASIER TO OPERATE. Controls in easy grip roller type handle. No knife type switches. No toggle switches.

POWERFUL MOTOR that operates for as little as 8c per 8 hr. day. Heavy duty 12-volt for level operation, 18-volt for continuous ramp duty.

FOUR POINT MOUNTING UNDER LOAD insures stability.

BRAKE MOUNTED ON DRIVE WHEEL relieves strain on chains and gears, insures safety.

WRITE FOR BULLETIN NO. 50, and Specifications.

2 GREAT, NEW PORTER CUTTERS

for cutting extremely hard materials, including stainless steel

PORTER CARBIDE EDGED CUTTER

Another important Porter development for cutting extra hard materials, such as stainless steel rods, wires, pins, etc. Tough carbide edges are firmly brazed to cutting jaws. Stands up under the toughest usage! Pays for itself many times over. #3CE cuts up to ⅞ dia. #4CE cuts up to 1⅝ dia.

for cutting hot steel bars, rods, wires, etc.

PORTER HOT METAL CUTTER

An ideal tool for steel mills and fabricating plants. Made of special hot work steel and special heat-treated jaws, for long life under continuous heavy duty with no loss to cutting edge temper.

#3HW cuts up to ⅞ dia. #4HW cuts up to 1⅛ dia. Order through your industrial supply house!

H. K. PORTER, INC., 74 Foley Street, Somerville 43, Mass.

distributor in that area. R. A. Villacres is export manager of the Minneapolis firm.

New York

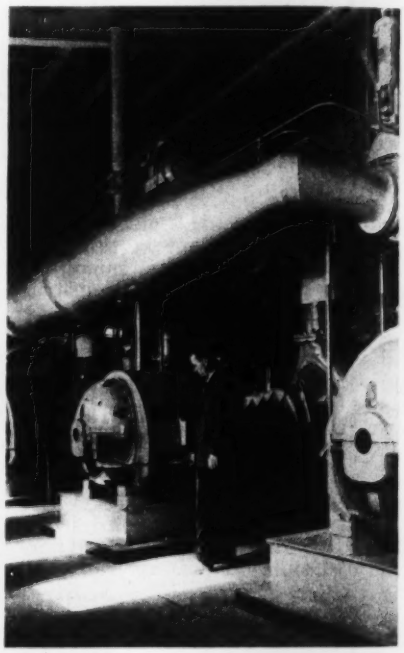
Jeffrey Steel Products Corp., Brooklyn, N. Y., opened its new and larger manufacturing facilities at 1345 Halsey St., that city. The company manufactures steel cabinets.

New York

Forker Corp., Cleveland, appointed Syracuse Supply Co., Syracuse, N. Y., to represent the Ohio Tramrail Systems' line of cranes, transfer bridges and tramrail systems in the central New York state area. The Syracuse Supply Co.'s sales efforts on Forker equipment will be directed by C. L. McGovern, manager of the Material Handling and Equipment Transmission Division.

Ohio

Snow Metal Products Inc. was organized in Cleveland to enter the manufacturing field, specializing in metal products, including machinery. Incorporators are Harold G. Snow, Ruth Snow and W. C. Fisher, all of that city. Sam B. Fitzsimmons is acting as statutory agent.



HYPERSONIC: That's what the new wind tunnel at CalTech, Pasadena, Calif., is called because of the terrific air speeds attained. The speed is higher than ten times the velocity of sound. Powdered principally by General Electric motors, the tunnel was designed and built for the institute and the Army Ordnance Corps to provide vitally needed information for use in the design of future missiles at speeds well above those of present-day rockets and missiles

Ohio

Reno Stamping & Mfg. Co. was incorporated in Cleveland by Howard M. Metzenbaum, statutory agent, Jerome A. Klein and Robert R. Disbro. The company is authorized to enter the metalworking field on a wide scale: To do stamping, tapping, drilling, tool and die work and to

Investigate the Advantages of H & K PERFORATIONS

—for cleaning, grading, straining and filtering . . . guarding and ventilating . . . accoustical treatment . . . ornamental enclosure, and related problems of product and machine design.

You have a wide selection of patterns to choose from, all accurately perforated. For commercial processing, perforations may be had with as close as ±.0005". Materials include practically all metals and sheet materials such as plastics, fabrikoids, plywood, etc. Ornamental grilles are furnished in lightweight quality stainless, bronze, brass, aluminum, etc.

Perforated sheets may be furnished rolled, formed, sheared, welded, brazed or otherwise fabricated to your specifications.

Catalog No. 62 tells the "hole" story—write for it!

The Harrington & King Perforating Co

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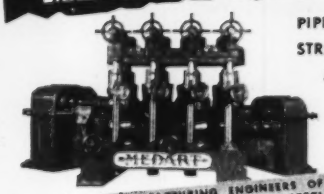
114 Liberty St., New York 6, N.Y.

MEDART MULTICYCLE

PIPE AND TUBE STRAIGHTENING MACHINE



AVAILABLE IN SIZES FOR MATERIALS FROM ¼ IN. TO 18 INCH DIAMETERS

MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

MEDART

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INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
69 illustrations **Price $5.00 Postpaid**

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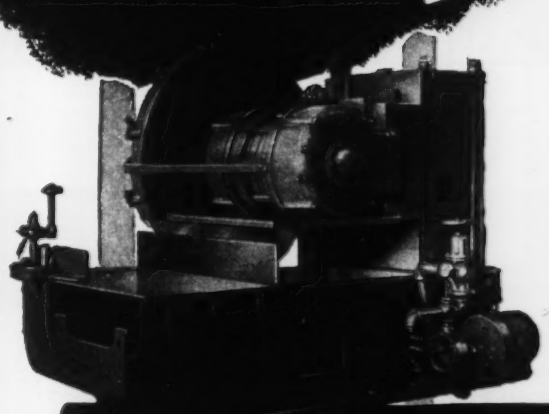
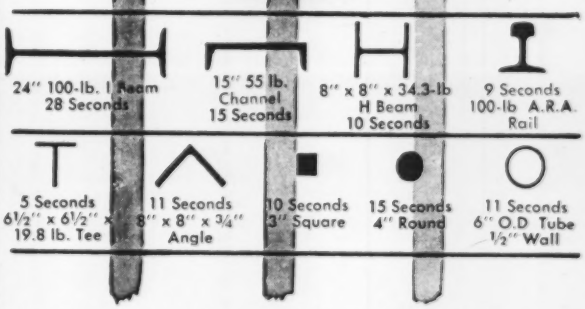
Book Department, 1213 W. 3rd St., Cleveland 13, O.

Modern Sawing



with KLING HIGH SPEED FRICTION SAWS



Friction sawing is one of few mechanical processes which employ the heat of friction in a useful manner. It concentrates heat on the material to be severed at a rate which is faster than it can absorb heat. The immediate temperature rise of the contact surface is so great that its strength is reduced considerably lower than that of the colder blade rim. This heated surface is readily removed by the blade and permits complete severing of the material rapidly with no loss of metal from the blade.

Because of its versatile ability to cut many varied structural shapes, as well as solid or hollow bars in any sequence, without change of blade or set-up, one machine can handle a volume of cutting that would otherwise require several separate shears or slow speed saws.

Consult Kling engineers regarding your metal cutting problems. State size of material to be cut. Bulletin No. 9200 giving full particulars and suggestions as to the type and size of saw will be mailed promptly. No obligation.

KLING BROS. *Engineering Works*

Punches; Bar, Angle and Rotary Shears; Combination Shear, Punch and Copers; Plate and Angle Bending Rolls; Heavy Duty Grinders

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